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THE FAR EASTERN REVIEW

ENGINEERING FINANCE COMMERCE

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遠東時報

THE NATIONALIST OPPORTUNITY

CHINESE POLITICS AND FOREIGN POWERS

"THE NEW KOREA"

DEGENERACY OF MANCHURIA

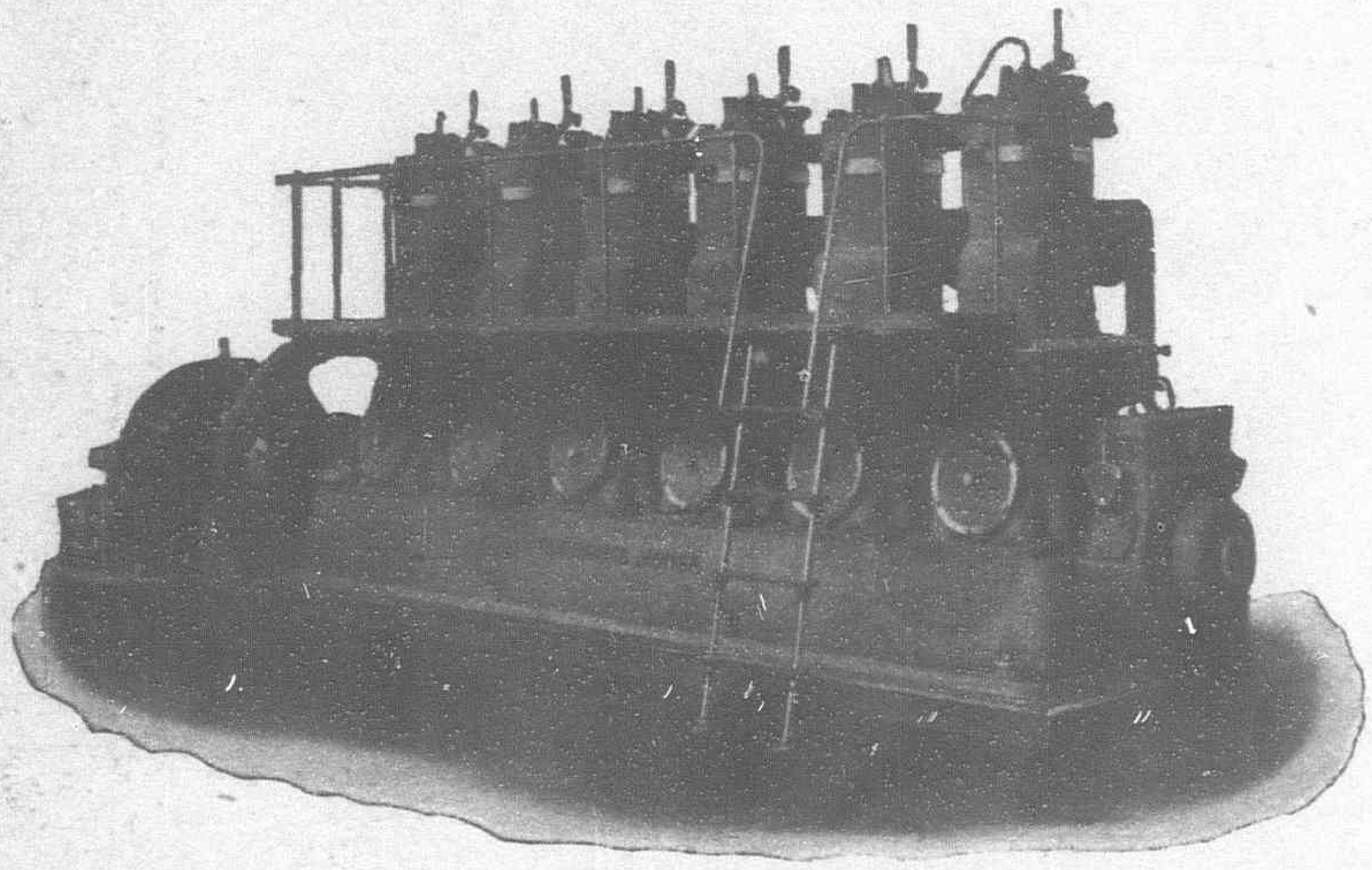
PEKING-MUKDEN RAILWAY WORKSHOPS

BRITISH TRADE AND INDUSTRY

YUNNAN-KOPEI RAILWAY

Vol. XXIII March, 1927 No. 3

SHANGHAI, PEKING, TOKYO AND MANILA



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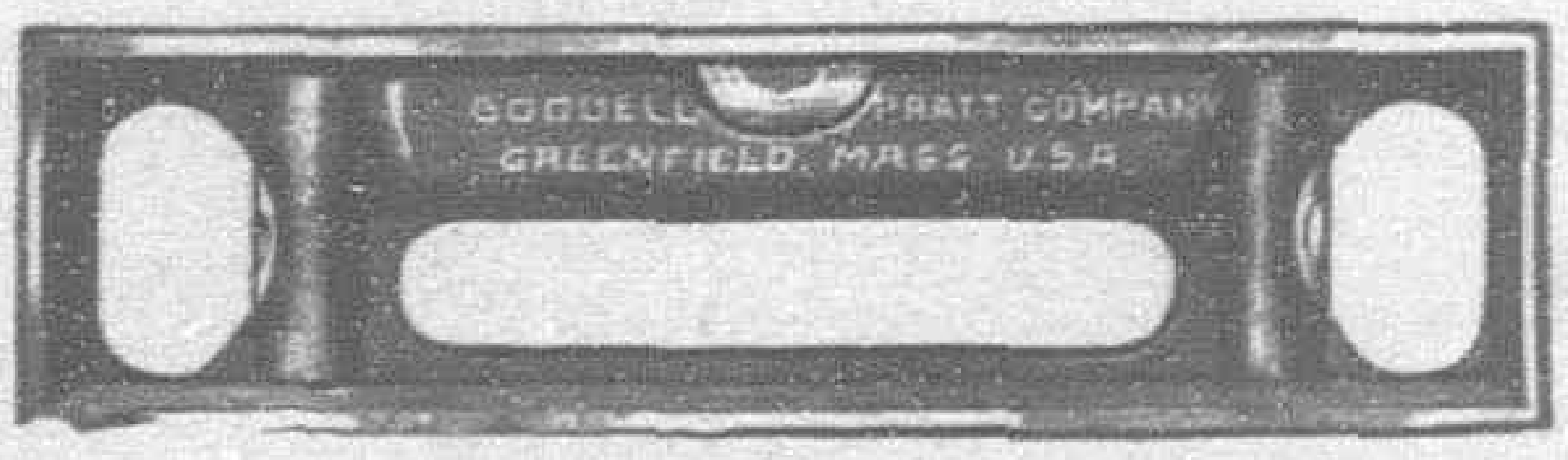

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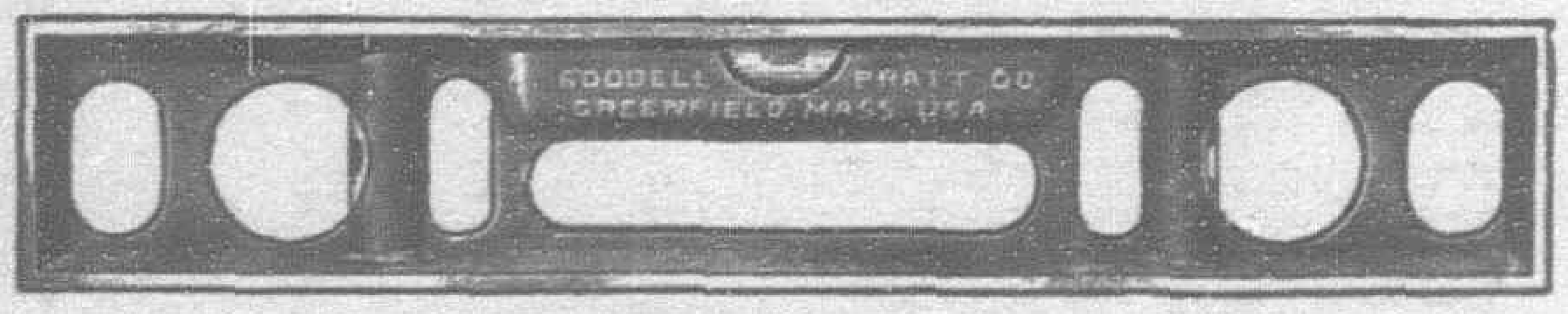

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXIII SHANGHAI, MARCH, 1927 No. 3

The Nationalist Opportunity

Only by Constructive Measures for the Political and Economic Development of China Can Equality Among the Nations be Won

All Sympathies with the Kuomintang but Opposition for the Communists

FOR fifteen years, the Kuomintang has been struggling to become the dominant party of China, to control its destinies and to win for China the position her size, wealth and population would seem to entitle her to. Until recently these efforts have met with failure. The Kuomintang never controlled a well-trained, well-equipped, powerful military arm and the Northern militarists have been able to frustrate any Kuomintang attempt to spread its control over territory beyond the province of Kuangtung. During the past year, the military progress of the party, under the command of General Chiang Kai-shek, has been phenomenal. From possession of little more than the city of Canton, they are now the rulers of almost the whole of China south of the Yangtze River and possess the two wealthy cities of Shanghai and Hankow.

The Kuomintang has not had breathing spell to consolidate its victories or to secure itself in the newly conquered territory. They have been forced to use an economic weapon to assist them in their struggle which is fast becoming more powerful than the Nationalist army and the Kuomintang party. The Communist Party of China, which Dr. Sun permitted to enter the party to assist it to victory, is gradually usurping the Kuomintang and the Nationalist Movement. Instead of this wonderful victory being used for the benefit of China, it is being used to embroil China in a war with the Powers of the world and to propagate fantastic ideas of world revolution which have failed everywhere. It is unfortunate that the Kuomintang should have departed from the Three Principles of Dr. Sun and to have been channelled into altogether a different field which is foreign to China and from which China has nothing to gain but a heritage of world-wide troubles.

What China requires at this time is not a wild goose chase after threadbare European idealism but rather reconstruction, the building of roads and railroads, the development of industry, the improvement of agriculture, the education of the youth of the nation, forests of smoke-stacks—these things can only be achieved by vision and energy. But they will never be achieved by fulsome antagonisms against foreigners in China, unmeaning attacks upon existing institutions. The Communists are not thinking of the welfare of China ; they are concerned only with the world revolution, with China as a jumping-off place for a proletarian revolt against capitalism. But in China there is neither a genuine capitalism not a genuine proletariat. There is only the beginnings of both. Therefore, it is not to China's advantage to use the successes of the revolution for this purpose.

As regards foreign Powers, it may be true that China seeks and is justified in seeking a full revision of exisiting treaties. But such a revision will not be achieved by the methods which China has adopted. It is futile to believe that Great Powers will submit to being bullied, to insults and attacks, to driving their nationals out of the places they have built up during a century of tremendous human effort. The British have patiently surrendered Hankow and Kiukiang, but the experience of the British has discouraged Japan from taking a similar step. It has been Japan's intention to revise all treaties and to treat with China as an equal. But the unfortunate results of Britain's policy has made Japan think twice before giving up too much. China's policy under the present regime in Hankow is discouraging her friends, is making it difficult for anyone to be helpful and is isolating China, so that when one Power attacks, all will join in the fray. At the end of the Washington Conference, China had won a great diplomatic victory and had friends among all nations. To-day, China is again without friends, except Soviet Russia. And it is not to be believed that Soviet Russia alone is strong enough to save her from the anger of a disappointed world.

"The Far Eastern Review" has always been a supporter of Dr. Sun Yat-sen and of Kuomintang principles. "The Far Eastern Review" to-day believes in Chinese nationalism, but there is the natural disappointment that Chinese nationalism is becoming so strongly tainted by Communism. It can only be hoped that this is a passing stage from which the Kuomintang and China will soon recover.

Chinese Politics and Foreign Powers

PROFESSOR Harold S. Quigley, who was formerly connected with Tsing Hua College in Peking, has prepared an interesting but biassed pamphlet on the subject of China's international relations and internal politics for the Carnegie Endowment for International Peace, which would be a valuable guide to the present situation, were it not that some of Professor Quigley's date is somewhat old. Apparently, he has not been close to the Far Eastern situation recently, which in China, means within the last year or two. It is especially when he deals with Japan that Professor Quigley shows a lack of understanding of Japanese aims and policies in China. He rather reverses the picture when he suggests that Soviet Russia is worried over Japan's activities in Manchuria : Russia need not worry with thousands of miles of wheat bearing steppes, with huge rivers and seas producing food, with a superabundance of raw materials. *Japan must have access to the food and raw materials of the continent of Asia to live* and it is unreasonable of the western Powers, for the United States to question Japan's right to exist when the Japanese people have been active, steady, productive, while Russia has thrown the whole world out of gear and China is to-day treading the path of Russia.

When Professor Quigley then states, as will be noticed in that part of his article which we reproduce, that " a large part of the favorable influence (of Japan) thus being exerted is cancelled in the Chinese mind by Japan's policy in Manchuria," he is stating not facts but what we in China term, C. P. propaganda, C. P. standing for that effective anti-foreign organization, the Communist Party of China. Compare Japan's activities in Manchuria with Russian activities in South China: Japan has built railroads and brought wealth to three provinces; Japan has developed the bean industry until it has become one of the principal sources of wealth to China; Japan has developed forests, water power, coal mines. Japan has sunk almost two billion yen into Manchuria and the profits have been very small, almost nothing, directly. Indirectly, of course, Japan has an assured source of food and raw materials. On the other hand, Professor Quigley's statement that South Manchuria does not attract non-Japanese enterprises, is far from the exact facts: most of the enterprises in South Manchuria are Chinese-owned. In fact, the city of Dairen is so much a Chinese city that one is rather amazed at the tremendous growth of Chinese enterprises there. Just as in Shanghai, seventy per cent. of the real estate is Chinese-owned in spite of the so-called British dominance of that city, so in Dairen land and business is largely Chinese-owned. It is only natural to expect that the preponderance of foreign trade will be through Japanese firms as the greatest share of the business is done with Japanese.

Again, when Professor Quigley analyses the causes of American unpopularity, he states " what was lost at Versailles was regained at Washington." It is difficult to realize that any man who claims to be a student of Far Eastern affairs could make a statement so remote from the facts. Not a party in China has anything favorable to say with regard to the Washington Conference. The North regards it as an impediment to their international activities; the Nationalists regard it as an international conference designed to curb their progress. Dr. Sun Yat-sen believed that it was aimed at him. The evils of Versailles have been forgotten by, from the Chinese standpoint, the greater evils of Washington. Professor Quigley apparently writes from an experience many years old and by hearsay, for when he suggests that America assumed any leadership, positive, effective leadership, either with regard to the Tariff treaties or the Extraterritorial Commission, he does not know the facts. When he writes of the United States, he repeats the empty, sixty-year old Catch-phrases, which nobody in China takes seriously. When he says that there are no evidences of American territorial possessions in China, he foregts that American ships patrol China's rivers and Americans live in foreign concesssions and international settlements. Some of these remarks are superficially true, but historically bunk.

We reprint from Professor Quigley's pamphlet:

Japan

Japan at the present juncture wears the smooth vestments of conciliation. Deprived of her Shantung acquisitions, her Manchurian " Demands" reduced or denationalized, her amour proper outraged by the immigration act, Japan has given the world an amazing proof of civilization in her temperate conduct. She has turned the other cheek when she might have been expected to indulge in a frantic but futile program of revenge. Her view to-day is the long view; she is willing to wait. And while waiting she is improving her time making friends; not as a respector of persons either but wherever she finds a welcome. Beyond doubt this friendly attitude has succeeded. No state to-day calls Japan enemy, not even China. With Russia she is back on terms of tolerance. And she maintains her place among her allies and associates of the War period with undiminished influence.

This happy position she has attained within a decade of the " Twenty-one Demands and the " Nishihara Loans." And during that decade her political and economic fabric has been pulled and hauled more persistently by reformist elements than at any previous period while her problem of after-war readjustment has been a serious one. Her accomplishment is remarkable and is to be attributed to the astuteness of her statesmen and the reserve strength, physical and mental, of her people.

Toward China Japan's policy is aimed at bringing about a common attitude and a joint program of action in the preservation of the territorial and administrative integrity of the two empires. This policy is complemented by an unofficial movement among the literary people of Japan toward producing a mutual regard among Japanese and Chinese for Oriental culture and mutual action to maintain and intensify it. This phase of the situation resembles the stimulation by certain groups in England and the United States of the mutual recognition of " Anglo-Saxon" customs and ideals. The existence of the policy of conciliation is demonstrated by Japan's action in restoring Tsingtao and the Shantung railway and other privileges, by her withdrawal of troops from Hankow, her surrender of her control of the " Asiatic Monroe Doctrine"—tacit in her acceptance of the abolition of spheres of influence in China—and her withdrawal of Group V of the Twenty-one Demands, also by a number of less advertised actions, such as her support of Chinese opposition to a foreign railway supervisorate, her lukewarm support of the Consortium's conditions of financial supervision by lending powers, her attitude on certain issues at the Tariff Conference and her failure to take vigorous action in a number of incidents in which Japanese nationals have been killed or injured, the last of which involved an affront to a Japanese warship. All of these circumstances and others that might be cited exhibit an attitude the reverse of that represented in the Twenty-one Demands and one that must, in time, have its effect upon Chinese sentiment.

Unfortunately, a large part of the favorable influence thus being exerted is cancelled in the Chinese mind by Japan's policy in Manchuria. Just what that policy is it is difficult to summarize in a paragraph. The most important of the Twenty-one Demands that still survive are those which compelled China to extend the leases of Liaotung, with its great ports—Dairen and Port Arthur—and the railways of South Manchuria to 99 years. And with the leases are associated Japan's monopoly—in fact if not in name—of the Fengtien coal and iron beds. In the Consortium negotiations—the outcome of which was made a part of the record of the Washington Conference—Japan was led to water down her expression of railway ambitions in Manchuria. But she did not surrender them by any means and it is highly significant that the Consortium has not built any railways in Manchuria while the South Manchurian Railway has been engaged recently in laying rails north from Taonanfu for a line which was specifically set down in the negotiations as one to be built by the Consortium. Ostensibly the work has been done on contract for Chang Tso-lin, the dictator of Manchuria. But to the Chinese it must appear as though the Consortium had made a " grand-stand play" to get Japan to include her spheres within the pooling limits of the associated banks in order to get China's confidence, with the understanding that Japan would be left alone in the actual exploitation of South Manchuria and Eastern Inner Mongolia. Meanwhile South Manchuria fails to attract non-Japanese enterprises and takes on day by day a more Japanese aspect. Is Japan hoping that a policy of supporting China's wishes elsewhere will prove an adequate compensation for South Manchuria? In the development of Chinese sovereignty there will not be room for the obvious political corollaries of the sweeping economic activities which Japan now exercises in that region. Either Japan will have to restrict herself to purely economic enterprises or she will have to annex the region. So long as the Chinese continue to believe, as they do to-day, that Japan contemplates—given the time and circumstances—the annexation of a portion of Chinese territory, Japan will find it difficult to bring about that cordiality of relations which to-day she is seeking so consistently.

With Russia Japan is back on a treaty basis and an influential—but not the most influential —section of Japanese opinion is supporting the establishment of a close accord with the Soviets. The success of that group, however, would involve a sacrifice of Japanese ambitions, which are no longer satisfied with a free hand in developing southern Manchuria but contemplate railway building and other enterprises in the northerly portions of that great region which were recognized by Japan previously as Russia's sphere of activity. Russia continues to desire that sphere, is in a position to hold it and cannot be expected to ally with Japan on and other basis than the old one of a division of Manchuria and Mongolia between them. A nice problem, therefore, remains to be worked out between Japan and the Union of Soviet Socialist Republics.

Undoubtedly Japan places first after the retention of her Manchurian position the maintenance of the most cordial relations with the United States and the British Empire. In this connection the outstanding features are the doctrines of the open door and the integrity of China. Toward making these doctrines effective Japan made by far the greatest contribution at the Washington Conference in surrendering her Shantung conquests, raising no objections to the operation of the most-favored-nation clause in South Manchuria, agreeing to the abolition of spheres and dropping Group V of the Twenty-one Demands. Through these provisions Japan aligned herself definitely with the powers which have stood most consistently for the open door and China's integrity.

Granting this, Japan's problem is that of maintaining harmonious relations with her two great competitors for the trade and exploitation of China while at the same time seeking to establish a Far Eastern " front" toward the West and to explore the possibilities of her new rapprochement with Russia. She has the great advantages over Great Britain and the United States of position, of cheaper labor and of intimate acquaintance with the civilization of China. If she wished she might raise the slogan of race equality. But so far she has demanded simply equality for her own people, a sign of her difficulty in trying to face both East and West at the same time. What she lacks are capital, mineral resources and food for her people. The two latter she now obtains from South Manchuria and to retain them, on *same* assured basis, she would probably stake her existence, as would any other people which had received recognition as a great power.

Japan is not inclined to-day toward any type of co-operation with other powers designed to supervise or control any feature of Chinese administration. In this respect she is, apparently, more solicitous of China's administrative integrity than are the other Consortium powers. This may be true or it may be that she anticipates greater influence for herself if the proposals of international supervision are thwarted. At any rate her opposition to any extension of foreign supervision is an obstacle to smooth relations with the other powers. At the same time it is in accord with China's new nationalism and with the vaunted anti-imperialism of the Soviets. This development, together with the fact of the Russo-Japanese treaty, finally concluded after a prolonged series of negotiations, and the arrival of China and Russia upon a working basis, has promoted the suggestion that a Far Eastern bloc is in process of formation having for its main object the destruction of Western preferential rights in China and the adoption of a unified program toward other powers.

The considerations already dealt with which have a bearing upon such a possibility need not be rehearsed. It is clear that Japan wishes to pursue a policy of friendship toward all nations to-day and that she will not willingly join any combination that would bring her into opposition with other countries. She prizes her high place in international society and her very profitable trade with the United States. She has special reasons for seeking the confidence and co-operation of China and Russia but it would be no compliment to Japanese diplomacy to suggest that it would think of weighing China and Russia in the balance as against the British Empire and the United States. Nothing but the desperation of a struggle for self-preservation would lead her to take that course. At present there is no sign in the sky to warn of the approach of such a struggle.

Russia

To analyze the contemporary position of Russia in the Far East is a task rendered no easier by the progress of the Union of Soviet Socialist Republics in obtaining recognition from all the great powers save the United States. If her success in that direction has brought her back into international society it has not increased her respect for its diplomatic usages nor for the world policies of any of its leading members, world policies which she, with doubtful consistency, asperses. Consequently it is necessary to take account of her declared principles of a world proletarian dictatorship and of opposition to imperialism while surveying her activities for evidence on their relationship to her theories of government and international politics.

The Soviet Government won the esteem and confidence of the Chinese people when it surrendered voluntarily those general treaty rights—extraterritoriality, customs control, residential concessions, and legation guards, which the newly-awakened nationalism of China so strongly resents. It is true that the Chinese Government had cancelled a number of Russian rights prior to 1924 so that the treaty of that year between China and the U. S. S. R. was little more than the recognition of *faits accomplis*. And it may be stated with some assurance, in view of the short-sighted encouragement given by allied powers during the war period to Chinese action in the deportation of Germans and the confiscation of their property, that Soviet efforts to retain the treaty rights would have failed to obtain the support of the powers. The Soviet Government hardly can be blamed for resenting the one-sided abrogation of the privileges inherited with the Tzarist treaties, since thereby its bargaining power was greatly diminished. But is appears now to be probable that it intended to surrender its rights in order that it might use its new position of " equality" with China as the platform from which to deliver the attack upon the " imperialistic powers" which has appeared as the most striking and consistent feature of its policy in China since May 31, 1924.

Between 1920 and 1926 there has been time for the Chinese to appraise the Russian sacrifices and to discover that they do not include all that had been anticipated from the manifestoes that were published. On the Russian side it has been found that the influence of Chang Tso-lin, in control of Manchuria, must be countered before arrangements made with a less recalcitrant government at Peking can become effective. Relations which seemed to be developing very cordially, culminating in the Sino-Russian agreement of 1924, have not yet produced a definitive treaty and the likelihood of such a treaty being signed is difficult to estimate. In the meantime the Soviet Government has employed itself in public incitement of the Chinese people to a revolt against the " unequal treaties." The significance of the denunciations, the amount of " Soviet gold" distributed and the influence of Russian civil and military advisers, have been exaggerated. The Russian sun and rain have played upon soil well-seeded and fertilized to produce an earlier crop. The seed and fertilizer have been the general contribution of Western ideas, not least of them American. Nor is the crop genuinely Bolshevik, since, as the Russians themselves admit, Chinese conditions are not suited to the development of communism. China has no exploiting class and no great class distinctions, no autocracy in government, landholding or the church. She is, however, educationally, industrially, and politically backward and she has come recently to ascribe her backwardness in large part to the various restrictions placed upon her movements by foreign control of her revenues and foreign exemptions from her laws. Wherefore her ready response when a single foreign nation surrenders rights which preachers and teachers of many foreign institutions in China have taught their students to regard as essential to that vague but universally desirable attribute which western states call sovereignty.

As in the case of Japan progress toward a mutually satisfactory Sino-Russian regime finds obstacles in the obvious intention of the Soviets to retain the old Tzarist spheres of influence in Outer Mongolia and northern Manchuria. True, Russia recognized in 1924 " that Outer Mongolia is an integral part of the Republic of China" but it is well-understood that the recognition of sovereignty has been in the past and may be in the future the disguise put on by a more powerful government in which the actual administrative control and usufruct of the " protected" territory resides. Russia faces Japan for the control of northeastern Asia just as truly to-day as ever before and she would hesitate, even if she were inclined to do so, to withdraw her influence from a region bordering her own territory so lengthily when the probability of Japanese influence taking its place is so strong. But in view of her long-standing interest and influence in Mongolia and of the comparative success of her propaganda there Russia is not inclined to do more than pay lip-service to the weak and distracted Chinese Government.

As for northern Manchuria the Soviets have dispossessed the surviving Tzarist influence in that region by the simple device of consenting to declare with China that " the Chinese Eastern Railway is a purely commercial enterprise"—as if it could be made such by the mere statement. Although the administrative usurpations of the old Russian regime in the railway zone have been swept away there is no way by which a great power can operate a railway through the territory of a weaker state without exercising political influence over the area and the government. Northern Manchuria thus continues a sphere of Russian influence just as southern Manchuria remains a Japanese sphere. China hardly will deal confidently with Russia under such conditions. Particularly when the Soviet Government, in its anxiety to get into control of the railway, stooped to make a separate treaty with Chang Tso-lin, who had, two years previously, declared Manchuria independent of the Peking Government.

Russia promises, without date, to withdraw her troops from Outer Mongolia and to permit the Chinese Government to redeem the Chinese Eastern Railway. It would seem that events may render both these promises obsolete. It would seem that there is the gravest possibility of circumstances, among which China's internal confusion would prove the primary factor, promoting a division of the spoils, on either a friendly basis or after another conflict, between the two powers at present in actual control of the vast northern marches of China. The disadvantages thus suffered by Russia and Japan in their diplomatic relations with China are not unique. Rather do they serve to place those countries, in Chinese eye, in the same class with the rest of the imperialistic powers and to offset any special advantages of position or similarity of culture.

Great Britain

The Chinese people respect and fear but do not love the British. Upon them they place the major portion of responsibility for forcing China to admit western intercourse upon equal terms and they think of England to-day in terms of territories lost or well-nigh lost, of government services—the customs and salt administrations—managed by aliens, of peremptory demands for strict observance of treaties—in short to the Chinese Britain stands as the author of their unequal international status and the guide of the Diplomatic Body in maintaining it.

The British reply to this attitude is characteristic: "Let the dead past bury its dead." To quote a recent writer: "Whether the foreign Powers were justified in breaking down the barriers imposed by Chinese ignorance and arrogance is no longer an issue. It was settled nearly a century ago." That for the issue of right. And as to the issue of advantage the author's next statements is typical: "And large and perfectly legitimate commercial interests, from which the Chinese have benefited to an even greater degree than the foreigner, have been developed in consequence." The first argument overlooks the fact that no issue is settled by force while the possibility of altering the settlement by growth in strength continues to inspirit the weaker party. The second is more substantial. But it also is defective, as many similar situations have proved, in that it rests upon the mistaken assumption that a people will exchange self-government for financial or other economic advantages.

The British have been, from the beginning of trade with China, at the centre of every argument which concerned the treaty rights of foreign states. History repeated itself very recently. The incidents involving bloodshed at Shanghai and Canton in May and June, 1925, have reacted upon the whole foreign community in China but principally upon the British. British trade is suffering a boycott to-day atCanton while that with other countries is welcomed. It has been the policy of Great Britain to deal firmly with the Chinese, to take no chances, to rely upon the shrewd business sense of the people rather than their friendship, to assure the safety of the foreign community by intimidation rather than conciliation. Whatever is owed to that policy in the past it has produced a legacy of ill-will to set beside its benefits.

Added to her own sins in the eyes of the Chinese were those of Japan when, in consequence of the Anglo-Japanese alliance, Great Britain was practically forced into endorsing the aggressive program of Japan. With the termination of the alliance began a new period in British relations with China, one in which emphasis was to be placed upon co-operation with the United States and the actual application of the Open Door doctrine. The evidences of the new policy on the British side are collaboration with the United States in determining the scope and terms of the loans that might be made by the Consortium and acquiescence in the American policies of holding the tariff revision conference and of carrying on the investigation of extraterritoriality and Chinese legal administration as provided for at the Washington Conference. In all of these projects the British Government has gone counter to the loudly expressed views of the British commercial community in China, though it has had the endorsement of the financial directorates in the city.

British relations with China were rendered more cordial by the statement of intention to restore Weihaiwei, the British lease in northern Shantung, but negotiations to that end have not moved rapidly. Opinion among British missionaries in favor of treaty renunciation has been grathering force and has been exerted to affect the action of the Government. Symptomatic of the realization of the issues at stake is the recent action of the Shanghai municipal council in voting to recommend the admission of a limited number of Chinese members. Recently the British parliament voted to return the unpaid portion of the British share of the Boxer indemnity to China. Most significant of all the evidences of the change in the British attitude is the refusal of the Government to compel the opening of the port of Canton, closed by the boycott, to British trade, in spite of the large losses undergone daily by British merchants through its closure.

The question of Tibet remains an issue between China and Britain. That little known region wishes to continue as in the past an autonomous vassal state of China. No doubt that relationship would be satisfactory to China if she could feel confident that it would remain permanent. But she fears that advantage will be taken of her slight control over Tibet and desires to bring the area more completely under her government. To Britain the interest in Tibet is two-fold—trade and security. She desires especially to maintain Tibet as a buffer state against Russia and she feels that the present status of Tibet is admirably suited to her purposes. In 1912 she refused to permit China, under the strong government of Yuan Shih-k'ai, to conquer the faction in Tibet that was opposing a closer integration of the territory with China. Not, apparently, wishing Tibet for herself, she will not permit it to become a portion of China proper. The issues involved compose a problem of extreme difficulty and one of which no solution appears to be in sight.

The Chinese realize that the amelioration of their international status depends principally upon the attitude of Great Britain, due to the preponderance of that country's investment in the trade and development of China. What they should also realize is that the British argument of mutual advantage is well-founded. In British governmental circles it appears already to be recognized that the new spirit of China calls for new methods of treatment and that it will be necessary to establish a more equalitarian relationship between China and capitalist nations before the former profitable era of railway and industrial development can be revived. Undoubtedly, British interests, like those of America, will prosper most in an atmosphere of equal opportunity provided that the Chinese are enabled to feel confident that the same equality exists for them as for the nations competing for their trade. The British position is a hard one to-day because it appears inevitable that in the impending period of restoration of authority the largest foreign interests will suffer the most. It is for China to take account of this fact and to moderate her demands for immediate emancipation. The important consideration is that the movement be forward and that Britain do not appear to be retarding the movement gratuitously.

The United States

Americans have not been mistaken in believing that the Chinese have regarded them as friends. Without smugness, because outsiders admit its truth, Americans may claim to have dealt more fairly with China than has any other important trading and investing people. That the Chinese of every class and in all parts of the country know this is evidence of the existence of channels of information accessible to the illiterate. The resulting good-will to-day is less evident. The people of China are tending to place America in a common category with the "imperialistic powers." It is not difficult to see why.

America's good name in China was earned during a period when other western countries were seizing her territories and demanding extensive spheres of interest. It was John Hay who, while terminating the movement toward the break-up of China, introduced the principle of the open door and in so doing placed the United States on an equality with other states in the economic development of the country. For two decades the open door policy was destined to lie in the pigeon-holes of foreign offices, to the disadvantage of the United States financially but to the preservation of American credit with the people of China. President Wilson contributed to our prestige in withdrawing from the first financial consortium in 1913. The change in America's position came when the President changed his mind and endorsed our re-entry into the consortium. The United States then became the dominant voice in a superpowerful combination of capital which was prepared to shut off the greater sources of loan funds from China unless that country would authorize a degree of foreign financial supervision which it considered both objectionable and dangerous. The life of the new consortium has been contemporary with a period of almost utter stagnation in governmental reorganization, railway-building and other constructive enterprises. For this the United States is held mainly responsible. Apparently China would rather take her chances with the powers separately than with the combination represented in the Consortium.

A second explanation of China's new attitude toward the United States lies in the definite establishment of the policy of co-operation with Great Britain which grew out of the Great War. To China that development meant a stiffening of American, as well as a relaxation of British policy. Evidence that this was a well-founded anticipation is forthcoming in American endorsement of the still-born plan to place a police force under foreign command over China's railways, in American participation in the protection of the Canton customs funds against seizure by Sun Yat-sen and in the recent threat to take naval action if the Peiho were not opened to traffic, as well as in the absence of criticism of such incidents as occurred last year in Shanghai and Canton. The attitude of the Department of State has not always been imitated by the representatives of Congress nor by private individuals.

The United States has been criticized by the Chinese for its failure to effectuate the open door policy. At present there is serious doubt among them regarding the American Government's attitude on the question of Manchuria. Loans of American banks to Japanese quasi-governmental corporations to be used in stimulating Japanese immigration to and industrial development in Manchuria appear to the Chinese, ignorant of the real attitude of the State Department toward such loans, to be evidence of indifference to the fate of Manchuria. American trade has not been able to meet Japanese competition, the Consortium has made no progress toward railway development and there appears to be, in general, a wait-and see policy regarding the region. It would appear that the lack of regular relations with Russia is a felt deficiency in the American diplomatic equipment for affecting the progress of Japanese control in South Manchuria and Eastern Inner Mongolia. It is not suggested that the American Government desires to hinder the development of Japan. America's relations with China are conditioned primarily by the universal desire of the American people for peace and friendly relations with Japan. What is desired is to accommodate Japan within the limitations of the open door and integrity of China policies. The record of the Washington Conference contains very little information of the problem of Manchuria but what it contains indicates that the government of the United States still regards Manchuria as a part of China.

In spite of these changes in the American situation it is probable that the United States has not altogether lost its special position in the confidence and good-will of the Chinese people. What was lost at Versailles was regained at Washington. American leadership has been marked in the effort to effectuate the tariff treaty and the resolution on extraterritoriality. The sentiment of American missionaries has offset the views of the associated American chambers of commerce in China. And the absence of such physical evidences of interference as settlements, leases, spheres, and protectorates continues to give to America a margin of advantage in Chinese eyes.

The American position is not an easy one. There is danger of falling between two stools—interest in the strengthening of China and in retaining her friendship on the one hand and co-operation with Great Britain and other powers on the other. To fail in the former desideratum would be to destroy a tradition and to lose an important advantage in the race for trade and investment opportunities, while to be isolated would mean to be compelled to meet vigorous international competition and to lose an opportunity for leadership. It will require the most astute diplomacy to keep the confidence of both sides.

British Trade and Industry

By Gilbert C. Layton, Assistant Editor of "The Economist"

(Special to the "Far Eastern Review")

Iron and Steel—Difficulties in Britain and Europe

THE new business being offered to British iron and steel manufacturers is not, perhaps, equal in volume to that expected immediately the coal stoppage was concluded. Thus a report from the Midlands states that "iron and steel masters find business very slow," while a Sheffield report declares: "A disappointing feature is the manner in which fresh business is coming forward." In Scotland manufacturers are also by no means fully employed. In some quarters, however, there are expectations of greater activity when the Chinese outlook is clearer and when the prices of iron and steel have fallen to a lower lever.

Meanwhile, there are indications that all is not well with the Continental steel trust. For some little time past there have been rumblings of discontent in Germany. In particular, Germany is aggrieved regarding the size of her quota. This proceeds from the altered position of her competitors, the factors responsible being the stabilisation of the Belgian franc and the appreciation of the French franc. In the present circumstances Germany holds that, given free selling, she would probably be transacting a larger trade than the quota allows her. While Belgium and France are engaged in a hard struggle to maintain their trade, Germany's production is increasing. Germany is not merely able to hold her own in the home market, but is successfully competing in markets formerly supplied by Belgium and France. Owing to this expanding production, Germany is having to pay increasingly larger fines under the terms of the pact. Last year she paid some fifty pfennings a ton in fines, but in the present quarter the fines are expected to reach three marks a ton. It is a significant index of present feeling that Geheimrat Reusch, the managing director of the Gute Hoffnungs-Hutte concern, has given emphatic expression in a public speech to the disappointment over the results obtained from the cartel, though it is true that he referred less to the practical than the political aspect of the problem. But whether or not there is any grave danger of the collapse of the cartel is uncertain. In any case, the pact is bound to exercise an important influence upon the economic evolution of Europe, so that future developments will be followed with the closest interest.

The British Railway System

At the time of writing three of the great British railway companies—namely, the London Midland and Scottish, the Great Western and the Southern—have announced their final ordinary dividends for the past year. In each case these show a substantial reduction as compared with those declared in 1925, while heavy drafts have had to be made upon reserves in order to pay the comparatively modest returns to the stockholder. This unsatisfactory position is, of course, chiefly due to the prolonged coal stoppage. It has, however, had the effect of focussing attention upon the economics of the British railway system and a noteworthy contribution to this subject has been made by Sir Felix Pole, general manager of the Great Western Railway. A few years ago, it will be recalled, some 120 separate lines were amalgamated into four large groups. This grouping was generally expected to lead to considerable economies. But have these economies been realised? Many traders, having particularly in mind the recent increase in rates, hold that they have not. Sir Felix Pole, on the other hand, contends that the companies have a strong case.

The real test of grouping economies, he maintains, is what would have been the *additional* cost to-day of working all the 120 lines as separate undertakings with present-day burdens. He estimates that this figure would have been at least $10 millions and claims this to be a truer figure of economies resulting from grouping; and he promises that more will follow. Moreover, Sir Felix says that the outstanding feature of the railways grouping act, apart from the grouping itself, was the constitution of a real bond of unity—of co-partnership—between the owners and users of railways.

He refers to the machinery for the determination of railway rates. This requires the companies to submit a budget of receipts and expenditure, to show how their accounts are prepared, to give the basis of depreciation and other funds, and a hundred and one other details, many of which were formerly regarded as the private business of the boards of directors. In future there will be little that is secret in railway affairs. Finally, Sir Felix Pole deals with the charge of inefficiency. This is not made by foreigners—not even by Americans—and in any case its substantiation before the body charged with the fixing of rates might have dire consequences for the company concerned.

Consolidating the Gas Industry

The British gas industry has a formidable competitor in the electric supply industry, which is bound to derive considerable stimulus from recent legislation. The gas industry is fully aware of this and is taking active steps to consolidate its position. Certain aspects of this problem were recently discussed before the Institute of Civil Engineers. It was suggested that economies could be effected if power were produced and applied as electricity instead of as steam. This could be generated by steam at a central station, the bulk of the steam being produced by waste-heat boilers. Instead of steam being used in small units at scattered points, it would then all be used at one point, the exhausts of engines using it discharging into suitable condensing plant. Assuming that the mean total power required on a new works would be the same as on an existing works where steam was used—namely, 14,071 hp.—494 b.h.p. would be required on an average day. If this were applied as electricity with an efficiency from steam to motor of 6.1 per cent. it would be necessary to generate only 8,098 h. p. of steam instead of 14,071 h.p. as at present. A plant capable of generating 818 h.p. or 610 k.w. would be required.

With this plant a higher efficiency should be obtained than on a 150 k.w. plant in use in an existing works, and assuming this to be 14 per cent. the steam required would be only 5,843 h.p. The saving in steam would amount to 233 tons a day, which at 25.3d. per ton gives a saving of £8,963 a year . If only 5,843 h.p. of steam were required instead of 14,071 h.p. as at present, it was shown that it would be possible to make 83 per cent. of the steam required on the works for gas-making and power purposes (apart from that necessary for the working up of by-products) on waste-heat boilers under average day conditions. Under existing conditions it would only be possible to make 42.1 per cent. of the steam required from the waste heat of the various carbonising processes.

Liquidation by Non-Payment

WHAT is the difference between debt repudiation *a la Russe* and continuous default *a la Chinoise?* China don't openly repudiate her debts, but, she does not pay them. Some of her obligations are being automatically discharged without the payment of a cent. The Hukwang bondholders received another notice of a sixth drawing for redemption on June 15,1927, amounting to £115,240 for 1,347 bonds of £20 each and 883 bonds of £100 each. The notice says that " interest thereon will cease to accrue on the bonds becoming payable and on provision having been made for their payment."

The Wall Street Journal says:—" But lucky is the bondholders whose numbers are not included in the drawn list. The joke is that interest has not been paid on Chinese bonds for over a year. Jokier still, is the fact that the holder who presents a called bond gets nothing, as the Chinese government has deposited no cash with which to redeem them. His bond is marked with a stamp meaning " not negotiable," which in turn means it cannot be sold. He is worse off than the holder whose bond has not been called, for the latter can sell his at 25 cents on the dollar on the New York Stock Exchange.

" If the Chinese government continues to call bonds regularly, by the time they mature it will have liquidated the remainder of its debt without the payment of a dollar in principal or interest. It is a remarkable piece of financing."

From the general tenor of American editorial opinion on Chinese affairs, the fact seems to be overlooked that practically every foreign loan to the Peking Government since the establishment of the Republic, has been made over the protest of Canton. The proceeds from the Reorganization, Continental and Commercial Bank, Pacific Development and so-called Nishihara Loans, were largely dissipated in military campaigns against the South. Unification of China following a triumph of the Cantonese armies will be followed by repudiation of these loans. American investors, perhaps, can afford to lose the few million dollars loaned to the Peking Government, but the amount involved in the British and Japanese loans makes their repudiation a matter of deep concern especially in the case of Japan, whose government has taken over the more legitimate of the Nishihara transactions.

Reorganization Bonds

It would be interesting to know just how much of China's foreign indebtedness is now held by American investors. Although American loans to China do not exceed $17,500,000 or perhaps $20,000,000 with defaulted interest, there is reason to believe that large blocks of Chinese bonds issued to European bankers have found their way since the war into American hands. An American who purchased some of the Chinese Government 5% Reorganization Bonds (Russian Series) has written the following letter to *The Wall Street Journal* :

" In 1921, I purchased some Chinese Government 5% Reorganization Bonds, loan of 1913 (Russian series). The Chinese government, I have been informed, has refused to recognize these bonds and has repudiated liability therefore, on the ground that they were stolen or confiscated by the Soviet government when they were found in Russia during the Russian revolution.

" I am anxious to find out the exact situation with respect to these bonds—that is, whether the bonds were in fact stolen, whether the Chinese government is liable for them nevertheless, and the names of the brokers who sold the bonds in this country and in Europe.

" I should be very much obliged to you if you would send me this information, as well as any other information concerning these bonds that you may have.—D. G. H."

The Wall Street Journal answers the above as follows :

"This loan was first brought out by five banks—each bank taking one fifth of the loan one of which was the Russo-Asiatic Bank. Interim certificates were issued and notice was sent out for exchange of these certificates into definite bonds. However, before the exchange could be fully consummated the Soviet government had seized the Russo-Asiatic Bank in Petrograd and found in its vaults some of these interim certificates. The Russian series were printed on yellow paper and the Chinese government has refused to pay interest on any of these bonds except where holder can trace back title and prove that he was an investor in these securities prior to December, 1917 (when seizure was made).

A British bondholders' committee was formed which brought suit against the Russo-Asiatic Bank which had an office in Paris. Suit was lost, however, but case was appealed and probably will come up for trial again shortly.

The firms of J. G. White & Co., and Paine, Webber & Co., of New York, together with several other houses bought up a block of these bonds a few years ago and re-offered them in this country. These houses have since been instrumental in helping American investors trace back title, and the Chinese government has recognized these bonds in many instances. These houses are also trying to get the American State Department to work with the British foreign office in bringing about a solution of the problem. The British bondholders' committee is also working to have the Hongkong & Shanghai Banking Corp. appointed trustee for the issue.

This issue is secured on salt revenues which are sufficient to pay interest on all bonds outstanding as well as to provide for amortization of the issue. With the Hongkong & Shanghai Bank as administrator of affairs relating to these bonds, it is believed that the position of the bond-holders will be considerably strengthened. British bondholders received an offer some time ago of a price of 20 cents on the dollar by some individual, but very few let their holdings go at this low figure. An editorial appeared in the London Times advising bondholders to keep their securities awaiting further developments and this seems to be the advice given by all the investment houses connected with the handling of these bonds.

"The New Korea"*

An Expert's Tribute to the Enlightened Administration of Admiral Viscount Saito

> **" So, with reference to Korea, there can be found in its history under Japanese rule instances of the abuse of power, of official incompetence, to some extent of corruption ; but whether or not Korea has on the whole been well governed can be determined only from a study of the available facts. From such a study, which has occupied me for more than three years, and of which the results are presented in this volume, I have formed the opinion that Korea is to-day infinitely better governed than it ever was under its native rulers, that it is better governed than most self-governing countries, and that it is as well governed as any of the British, American, French, Dutch and Portuguese dependencies which I have visited, and is better governed than most of them, having in view as well the cultural and economic development of the people as the technique of administration."—Alleyne Ireland.**

" The New Korea," by Alleyne Ireland, is a just tribute to the enlightened rule of Admiral Viscount Saito, the great Japanese Liberal, who, like his prototype in Manila, has dedicated the few remaining years of his life to a task calling for infinite patience, tact, kindliness, sympathy and human understanding. Saito at Seoul and Wood at Manila have sacrificed brilliant political careers at home for the responsibilities and uncertainties of administering the affairs of ungrateful and unappreciative dependents. It is fitting that a detailed account of the Japanese administrative system in Korea should be written by Alleyne Ireland, one of the foremost living authorities on colonial government. All fair-minded students of Far Eastern problems will welcome his expert endorsement of the man whose fine grasp of Japan's obligations, responsibilities and prestige has given to the world the picture of a New Korea whose remarkable advance in the last six years stands as one of the greatest achievements in colonial administration.

A comparison of American and Japanese methods of colonial administration is out of place here. In view, however, of the Thompson Report on " Conditions in the Philippines" in which criticism is levelled at the so-called " military government" of the Islands, it is well to invite attention to the weakness of a system which sends a great American executive to rule the Philippines and then denies to him the funds to employ competent civil assistants and the strength of a program under which a great Japanese statesman is sent to rule a dependency and the best available civil administrators selected to serve as his assistants. Governor-General Wood was compelled to seek his assistants from friends in the army who were willing to sacrifice their chances of promotion in the line to serve their leader. Admiral Viscount Saito's rule in Korea has been immeasurably strengthened by the appointment of the best civil administrators in Japan as his assistants. To Viscount Saito goes the credit, but he would be the first to admit that his success has been made possible by having at his side gifted administrators like R. Midzuno, whose brilliant record at Seoul led to his elevation to the portfolio of Home Affairs, and T. Ariyoshi, another expert civil administrator ranking high in Japanese politics. In seven years Saito has accomplished in Korea what he set out to do. The Philippines are still the football of American politics.

Mr. Ireland's book is free from bias. He refuses to become entangled in a discussion on the moral, ethical, legal, political, social or economic problems raised by the act of annexation as being irrelevant to a presentation of facts descriptive of a working system of colonial government. He adds, " the character of an administration is what it is, and can be fairly judged only on the basis of the data of its operation." Mr. Ireland then expounds the difference between imperial government and nationalism, showing that there is little in practice between the ideal voiced by Manuel Quezon when he said ; "I prefer a government run like hell by Filipinos than to one run like heaven by strangers," and the administration of a ruling imperial power. Both systems have their faults. Self-rule and dependent rule each have inherent in them the possibility of misrule but the chances for good, clean government are better in a dependency than in a democracy. Mr. Ireland's introductory chapter bears out our own thoughts on colonial government, that no matter what is done to better the condition of the dependent people, ulterior motives will be advanced to discredit the reforms.

" To combine a description of a colonial government with an essay on the moral quality of the imperialist principle," writes Mr. Ireland, " is to invite confusion of thought. Thus, in any given case, if the administration of an imperial government is found to be bad in fact, this badness will be used by nationalists as an argument against imperialism, whereas if bad administration is found in a popular government, nationalists will not tolerate any use of this badness as an argument against popular rule.

Viscount Makoto Saito

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* " The New Korea," by Alleyne Ireland, F.R.G.S. ; published by E. P. Dutton and Company, New York.

“Conversely, with reference to good administration; if nationalists find that it exists in fact under a system of popular self-government, they will welcome the finding as a justification of that system; but if good administration is found in an imperial dependency, nationalists will not allow the finding to stand to the credit of the imperialist system; they then shift the issue from the quality of the administration to the quality of the sanctions from which the government derives its authority.

“In a word, to the nationalists good government is good government if it is self-government, and even bad government is good government if it is self-government—in the first case because both good government and self-government are good; in the second case because, under self-government, bad government is merely a passing phase in the evolution of good self-government.”

A nationalist party in a dependency is chiefly concerned to attack whatever measures are carried out by the ruling power, and these attacks. Mr. Ireland points out, follow a very simple strategy. Thus: “If the local administration builds roads, erects schools, and so on, it is wrong, because the motive is base; if it fails to do these things it is wrong, because it is the obvious duty of an imperial ruler to confer such benefits upon a dependency. So also in relation to developing the resources of a dependency; if the sovereign power invests money in the colony, it is wrong because all it amounts to is capitalist exploitation; if it does not invest money in the colony, it is wrong because the failure to do so reflects a determination to keep the people poor and weak in the interest of an easy domination; if it employs natives in the government it is wrong because such a policy tends to weaken nationalist sentiment, if it fails to do so it is wrong because such a course discloses the purpose of making the colony the happy hunting ground of imperial officials.”

Mr. K. Midzuno

The success of a colonial government depends largely upon the point of view as to whether the material or cultural welfare of the dependent people is the highest obligation of the ruling power. Americans incline to the belief that their supreme duty is to elevate the cultural welfare of the people under their tutelage, while the Japanese adhere to the principle that by improving the material prosperity of their subject races a solid foundation is laid on which a permanent structure of self-government can be more safely erected.

Mr. Ireland draws attention to the fact that in little more than a decade the expenditures on education in Korea have been increased eight times and the same period had brought about an economic development almost unparallelled in the history of colonial administration. Korean agricultural exports have increased in a decade by more than 1,000 per cent. industrial exports by more than 3,000 per cent. fishery exports by nearly 3,000 per cent. forestry exports by more than 4,000 per cent. and mineral exports by more than 1,000 per cent. **If Korea were a self-governing country instead of a Japanese colonial dependency, it would be hailed throughout the Western world as an astounding example of national progress.**

Mr. Ireland touches upon a phase of international politics which is fast being lost sight of since the principle of self-determination and non-intervention in the affairs of other countries has become the ruling force in international relations. He says: “The internal administration of Korea, has for many years, been a matter of earnest solicitude to the Japanese. The dangers and annoyances associated with corrupt and grossly inefficient rule in a country whose southern coast-line is within a few hours steaming from Japan will be obvious to those who have had occasion to study the causes of the Spanish-American war, and to those who, to-day, are hoping to see Mexico develop in such a way as to encourage the most cordial relations with the United States.”

“There exists, indeed, a certain type of mind to which the contagion of misrule conveys no threat to domestic tranquility on the other side of a frontier, to which the circumstances of American territorial expansion, and of the extension of British rule in India, teach no lesson. Intelligent observers, however, are aware that bad government can be as poor a neighbor as bad health, that social unrest can cross a boundary line as readily as small-pox or yellow-fever, that the “land-grabbing” of the English-speaking races, which followed the original conquest or settlement was due in large measure to the necessity of bringing within the national sovereignty a neighbor who, for one reason or another, was a menace to the national welfare.”

The bearing of this doctrine on the fate of Korea and its possible invocation on the part of Japan to protect that dependency from the menace of brigandage, unrest, and lawlessness just over the border, is lost sight of in the attitude of the Powers in thwarting any independent action in China. Principles that apply in one part of the part of the world cannot always be applied in another part. A principle that sent America to war to protect her Southern States against the menace of yellow-fever will be difficult to apply at this time by Japan to protect her dependency against the menace that is fast converting China into another hot-bed of Communism. Many critics of Japan see in the development of roads and railways in Korea only a means to strengthen her strategic position in that territory. On the other hand, if Japan was not prepared to hold her own in Korea, it would not be long before the Soviet would again dominate Manchuria and force the issue that was scheduled for 1912 under the old Czarist regime.

Cleaning Up in India

BRITAIN is cleaning up in India. The conduct of the jewel-bedecked *maharajahs, rajahs, begums, nizams, gaekwars,* emirs, sultans, sheiks, caliphs and other holdovers from the Thousand and One Nights, is being thoroughly investigated and where they fail to conform to the British idea of proper behavior, a polite but unmistakable hint is being conveyed that they must toe the line. Britain is up against it in Asia. Stirred by the propaganda of the Bolshevists, the masses in India are muttering their discontent. Turkish nationals are inciting the Mohammedans to revolt. Moscow openly avers that its goal is India, the Achilles heel of British imperial dominion. The subjects of the native autocrats are showing unmistakable signs of rebellion against a

Medieval system of government which could exist in these enlightened days only under the protection of a super-Power pledged to non-interference in their affairs. The ostentatious display of great wealth together with the publicity given to the adventures of native rulers with the *haute demi-monde* of Europe, their escapades with dancing girls, race track touts and other scandalous exploits, is in too violent a contrast with the condition of their subjects exploited and maintained in abject poverty and semi-slavery by the rapacity of tax gatherers. Benevolent British imperialism is mocked and held up to ridicule by the despotic rule of satraps whose chief concern is their own vices and pleasures.

At a time when the aristocrats of England are selling their estates, auctioning off their heirlooms, and depriving themselves of accustomed luxuries and pleasures in order to exist within an income pared down to the vanishing point by taxation, it is peculiarly inopportune for Indian princelets to flaunt their wealth and advertise their vices before a critical public. British opinion is unanimous that the time has arrived when these nabobs should be definitely told where they get off.

Backed by popular sentiment, the Indian Office has informed Calcutta that the native rulers must conform to western ideals not only in their personal habits but in all government matters which affect the peace and happiness of the people. As a result of this sweeping policy, the Rajah of Cochin is abdicating and the Gaekwar of Baroda, who recently celebrated the golden jubilee of his reign, intends to abandon active participation in the government of his state. The Maharajah of Indore has been forced to abdicate, and the Nizam of Hyderabad given to understand just where he fitted in the scheme of British imperialism. The Mir of Khairpur's plunging on the Bombay and Calcutta race track led to a straight tip from headquarters that he would either have to reform, or hand over. He reformed.

The change in British policy is for the best. Maharajahs should be seen and not heard. Their vulgar and ostentatious display of wealth in an age when the radicals are out after Britain's scalp, is not conducive to that internal tranquility upon which depends to a large extent the future of the British Raj in India.

Whither Japan?

Nearly $400,000,000 in Japanese bonds are now held by American investors who want to know the truth about Far Eastern affairs. Some of the best reports on Japanese and Far Eastern conditions are found in the pamphlets circulated by leading American banks and investment houses for the information of their clients. The open-minded men who write these trade and financial reviews are guided solely by the facts. The following comment on Japan, taken from "*The Review*," issued by Strassburger & Company, (one of the leading investment houses and stock exchange operators of New York, San Francisco and Chicago) is one of the clearest commentaries on the Far Eastern problem that we have seen published in the United States.

There is no stronger reason, other than proximity, for enmity between this country and Japan than for enmity between Japan and her former ally, Britain. With us Japan should have no cause of quarrel, unless we make it ourselves. There is ample room for expansion of authority on her part, which need concern us little. The real danger lies in our arrogating to ourselves the right to dictate to her how far she shall go in a particular direction. Neither from us nor from Britain will Japan tolerate undue interference in her plans for growth; from her, neither has anything to fear through accomplishment of those plans.

Reference is to our neighbor's evident turning towards Asia. We, in common with Britain, have thrown cold water on her advances towards the English-speaking nations, and from Europe she has, at any rate until quite recently, received scant respect. It is easily conceivable that we are confronted with an apparent reversal of Japan's policy, indicating the rise to power of the party which never looked with favor on the Anglo-Japanese alliance and all that it seemed to imply. The first thing, however, is to cleanse our minds of the poison of suspicion, if our reaction to Japan's apparent policy is to be the potent influence for good that it may well be. We must visualize "Pan-Asia" as a natural grouping, as innocent in itself of danger as a British Commonwealth of Free Nations group, as the European group in process of formation, as the South American group, as others that will assume shape before many years have told their story.

We must, for instance, abandon, once and for all, the attitude recently expressed in an article from the pen of a self-imagined advocate of world peace, wherein he suggests that this country and Britain should combine to force in China a settlement satisfactory to them and, in some mysterious way, to China. Neither we nor Britain have any business to interfere with that ancient civilization, beyond the protection of our nationals in the legitimate pursuit (legitimate, mind you) of their avocations. One may go further and consider whether Japan has not a prior right to either of us, if interference from any other nation is in any way justifiable.

Britain must forget her past associations with Persia, and her nervousness in that regard, when she learns that Japan and that country are concluding commercial treaties. She must also consider seriously whether she has any real reason to resent Japan's rapprochements with Turkey.

To admit that others may be inspired by good motives is not, of course, to shut one's eyes to the possibility of sinister intentions. This is, however, a very different thing to assuming, always and finally, the worst. There is never a case so bad that it may not be mended, never a tortuous course that may not be deflected. Japan has her Yellow Press, inspired by dangerously powerful perverts, ever on the lookout for opportunities to shape the policies of statesmen to their own pitiful ends. She is not alone in this respect, but it may fairly be said that few human beings, wherever they be domiciled, deliberately choose or knowingly support courses of actions calculated to endanger the happiness of innocent inhabitants of any other country. It is a question only of enlisting the constructive forces that exist in a majority in every country under a banner that cannot be wrested from them by deranged diplomatists or military leaders.

Japan's so-called new policy does not really, as is being said, involve any changes in her relations with the rest of the world. Co-operation with this country, Britain, and Europe, is now as necessary to her as it has been in the recent past; a statement which includes China in its application. If we and others can be brought to an appreciation and acceptance of Japan's political needs, her economic view-point assures to all her friendship.

It cannot, indeed, be said that this turning towards Asia policy presents as yet any signs of consummation. China has not yet overcome her feeling that Japan has been in the recent past a traitor to Asia, regards her, too, as an upstart nation, with dangerous designs. Persia is willing to take all she can from anyone, but she knows who have been and may continue to be, her most useful friends. Turkey undoubtedly shows every sign of a desire to Westernize herself, to cut herself entirely adrift from her Asiatic past.

On the other hand, the Western world has shown signs of feelings of contempt for Asia, the League of Nations a leading offender in its attitude towards China. Of this attitude we may be in part absolved, but our pose of patron is equally offensive. Asia is old, does not forget her former greatness, realizes her potentialities.

There are dangers; there is also opportunity. The former may be averted by grasping the latter. May it not be hoped that with us, with Britain, with Europe, wise counsels may prevail?

River Dike Work in Shaohsing and Siaoshan, Chekiang.—The River Dike Work Bureau in Shaohsing, Chekiang province, was organised in August last to undertake the dredging and reconstruction of dikes and locks in Shaohsing and Siaoshan the work of the original River Dike and Lock Bureau being confined to ordinary maintenance. Lottery bonds of $5 and $10 denominations are issued by this new bureau to raise the necessary funds for the work. The first issue was started in October and subsequent issues are to be floated once a month until the work is completed. The local surtax for river dike work is only sufficient to meet maintenance expenses. In order to meet immediate requirements for urgent construction, the magistrates of these districts have succeeded in securing a loan of $100,000 from the Bank of China in Hangchow and Shaohsing, to be repaid in April next year. The bureau has employed some 600 men to dredge the river bed near Sinfawang for about 25 *li* and beyond the Ikiao Lock for a similar distance. Reconstruction of the dike at Sinlin has also been started, the dike to be extended to Wenyen and Changho. These repairs in Shaohsing and Siaoshan were necessitated by the flood of the Tsientang River early last summer.

A Sugar Plant in Java

The Redjoagoeng Rolling-mill Plant is Capable of Dealing with 1,575 tons of Canes in 24 Hours Representing a Return of about 220 tons Cane Sugar

THE extraction of juice from sugar-cane takes place with the aid of various sets of rolls, through which the canes are forced until the juice is pressed out nearly completely. Such a train of rolls of particular large dimensions and special design, has been recently delivered to Java, Dutch East-Indies.

This train of rolls comprises a cane conveyor with driving gear, a preliminary crusher with rolls measuring 865 .1,980 mm. (2.8 by 6.5-ft.) 4 sets of rolls of similar dimensions, the cane trash conveyors between the mills, a hydraulic pressure plant, and 5 complete sets of reduction gears with their five motors by which the crusher and the four mills are driven. In laying out the plant sufficient room was provided for the subsequent installation of a fifth mill.

The cane conveyor delivers the sugar canes to the preliminary crusher. It is about 33 m. (108.3-ft.) long and consists in the main of a strong iron structure, which serves as a guide for the endless conveyor belt. The belt itself is composed of three strong roller chains with boards placed across them. This belt carries the canes right up to the preliminary crusher, forcing it into the latter automatically. The conveyor belt is driven by a 40 h.p. electric motor. At the lower end a chain tightening device is provided.

The preliminary crusher is inclined at an angle of 75 deg. The frame is made of cast steel; the crushing rolls of the Krajewski type have a dia. of 865 mm. (2.83-ft.) and a length of 1980 millimeters (6.5-ft.). Hydraulic pressure is applied to the upper roller; the cylinders and pistons are accommodated in the bearing cap, which is firmly coneected with the frame by strong tension bolts. On the side facing mills, the frame of the crusher is supported by the frame of the first mill. Between the legs of the crusher there is a juice tray covered with a sieve. The juice pressed from canes in the preliminary crusher is collected in this juice tray and delivered to the juice tray of the first mill by a channel.

The rolling mills are equipped with rolls of 865 mm. (2.8-ft.) dia. and 1980 mm. (6.5-ft.) length. The upper roll is supported in bronze bearings, and pressed down by hydraulic pressure. The lower rolls are carried in vertically adjustable cast-steel bearings lined with white metal. The forces arising in the mills are taken up by strong vertical and horizontal the bolts. The upper bearing caps contain the cylinders and pistons of the hydraulic pressure gear for the upper rolls. In the lateral bearing caps of the lower rolls the pressure and tension spindles for the dredges for the adjustment of the lower bearings are held. The bed plate is designed as a closed frame, into which the juice tray is sunk. The distance between centers from mill to mill is 6.2 m. (20.3-ft.).

The cast steel used for the rolls is of a special kind. In addition to great hardness it has the peculiarity of acquiring a rough surface in the course of service, thus ensuring the crushed pieces of cane being pressed out well on their course through the mills. The shafts are all made of nickel steel of ample dimensions. All the bearings are fitted with forced lubrication.

The intermediate conveyors effect the transport of the crushed material from one of the four mills to the next. An endless belt of closely fitting boards carried by two chain travels over three sprocket-wheel shafts supported in ball bearings. The belt receives its drive from the upper roll of the mill by means of a chain gear. In order to be able to control the supply to the mills, the driving shaft of each of the conveyors is provided with a spring-band friction clutch, which can be operated both from the mill house floor and from the upper gangway. Before and after passing through the mills the cane-trash is soaked with juice and water by special appliances.

The hydraulic pressure plant supplying the load on the upper rolls of the preliminary crusher and the mills consists of five pneumatic accumulators an electrically-operated vertical two-stage air compressor, two small filling pumps (hand-operated pressure pumps), and the necessary pipe connections. With an air pressure of 50 ats. (735 lbs. per sq. in.) the hydraulic pressure generated in the accumulators amounts to 35 ats. (515 lbs. per sq. in.).

About 10-ft. above the level of the mill-house floor a gangway runs along the mills. From the main gangway smaller ones branch off to top of each mill, and one leads right round the preliminary crusher. The switches and controllers for the electric equipment are installed on the gangway, the attendants thus having an unobstructed view of the whole plant.

The drive of the preliminary crusher and the mills is effected by five three-phase motors of 250 h.p. each. The motor is direct coupled with an enclosed first set of reduction gears working in oil-bath. The motor and the first spur gear set are assembled on a common bed-plate. From the enclosed reduction gear the power is transmitted to the mills and the preliminary crusher respectively through two further sets of reduction gears and a coupling shaft with sleeve coupling. The mills and the preliminary crusher each have separate and independent driving gears. The three sets of reduction gears are mounted on a strong common bed-plate.

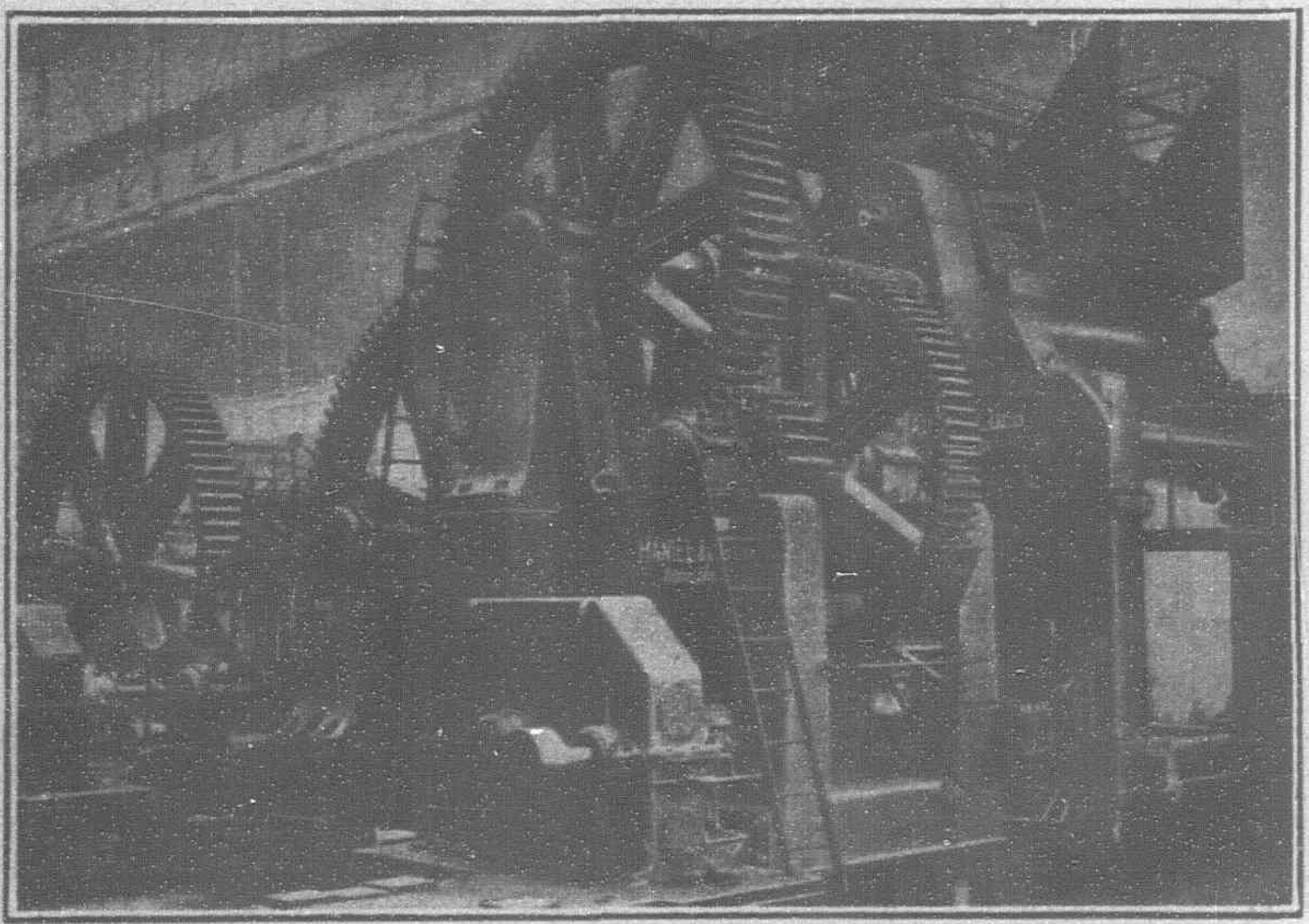


Fig. 3.—Preliminary Crusher with Reduction Gear for the Redjoagoeng Sugar Plant
(driving motor removed)

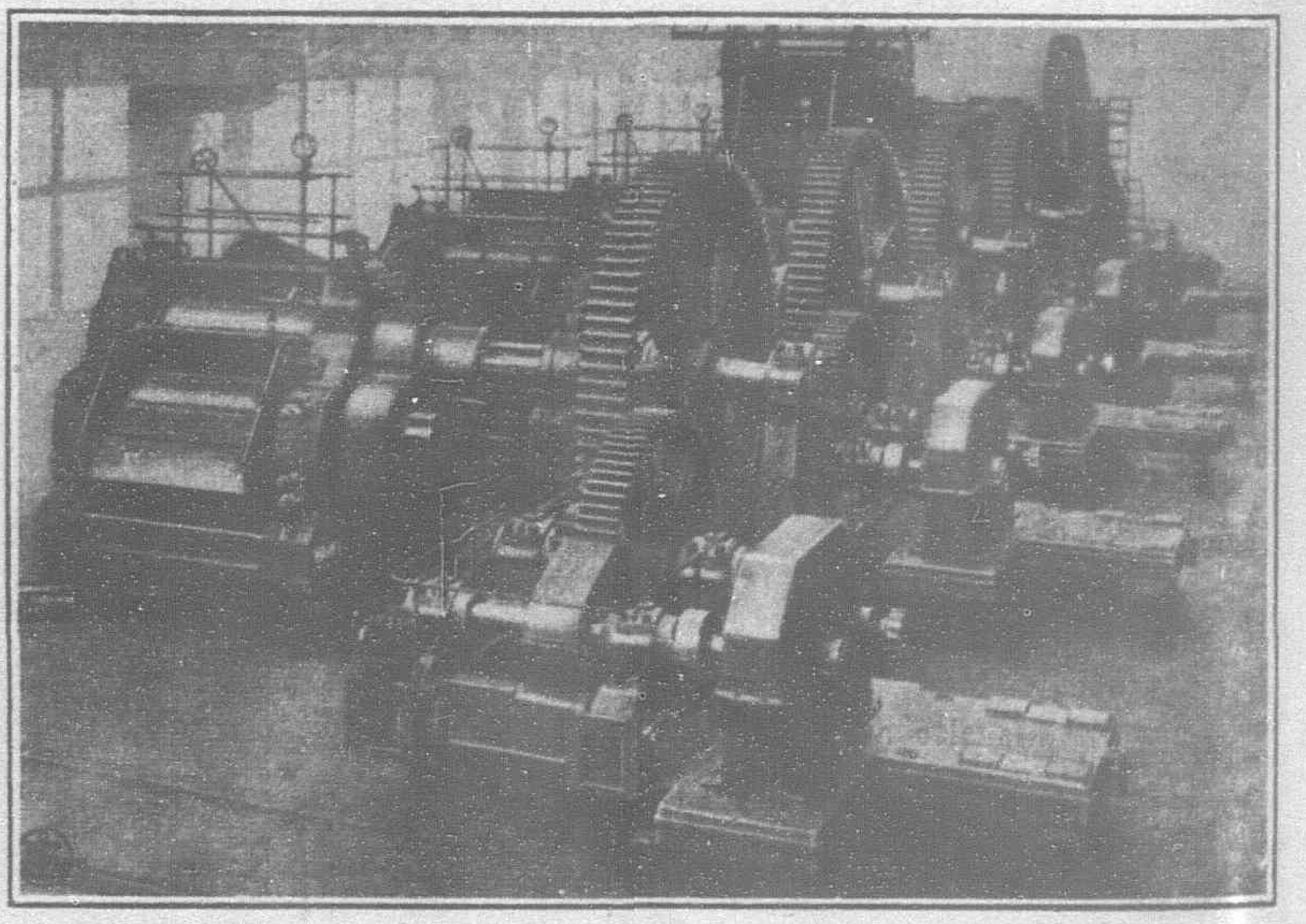
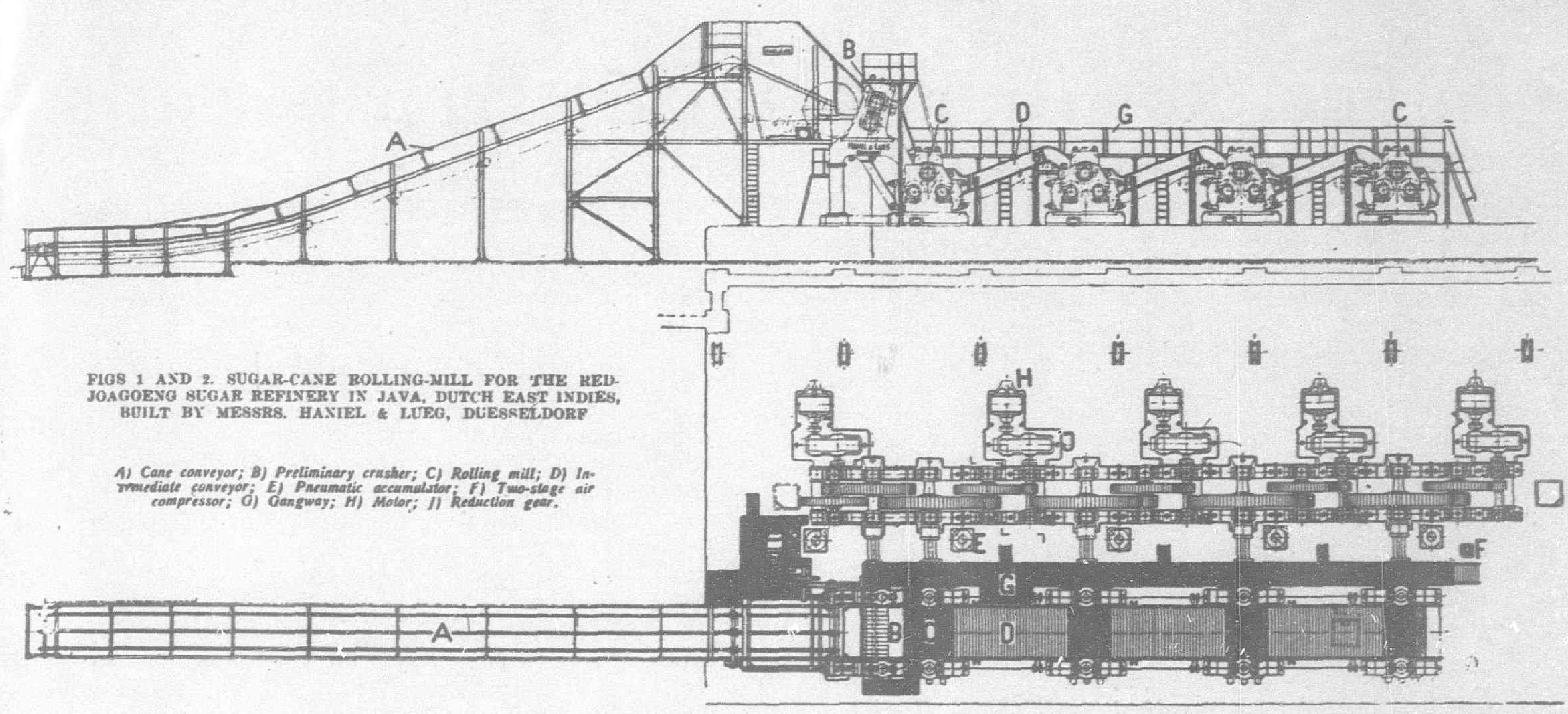


Fig. 6.—Sugar-Cane Mill, Viewed from the Driving and Reduction Gear Side
(driving motor removed)



FIGS 1 AND 2. SUGAR-CANE ROLLING-MILL FOR THE REDJOAGOENG SUGAR REFINERY IN JAVA, DUTCH EAST INDIES, BUILT BY MESSRS. HANIEL & LUEG, DUESSELDORF

A) Cane conveyor; B) Preliminary crusher; C) Rolling mill; D) Intermediate conveyor; E) Pneumatic accumulator; F) Two-stage air compressor; G) Gangway; H) Motor; J) Reduction gear.

The normal speed of all the motors is 442 r.p.m. With the preliminary crusher running at 3.2 r.p.m., the total ratio for reduction amounts to 1: 138. In the case of the mills working at 2 r.p.m., the total ratio is 1:221.

The power station supplying the electric current, comprises two steam-driven three-phase turbo-generators of 1,000 k.w. each, 45—66 cycles, 2,700—3,960 r.p.m. 360—580 amps, with 125 volt direct-coupled exciters. The turbines are singled-wheel Curtis turbines. The turbo-generators are fitted with tension governors for variable frequency. With their aid the speed can be controlled either by hand at the turbines themselves or electrically from the mill-house (from the operator's stand on the gangway) while the plant is running. The resistances and controllers for starting the motors and for controlling their speed can be operated both from the ground floor of the mill-house and from the gangway.

The sugar cane is treated as follows: The raw material is placed on the cane conveyor in a layer of even thickness and feeds into the preliminary crusher, where it is disintegrated and pressed; from there it passes on to the first of the mills, over a step chute. As the clearance between the rolls is reduced in each successive mill, the material moving forward from mill to mill in the shape of a continuous band, is pressed more and more thoroughly as it progresses. On the way between the mills it is repeatedly soaked with juice and water in order to open up the cells of the fibrous substance completely. When leaving the last mill the bagasse is therefore practically free of sugar. The bagasse (fibrous substance) leaving the last mill is transported to the boiler-house where it is used as fuel for the boilers. The raw juice pressed from the canes in the preliminary crusher and the mills, is delivered to the sugar refinery for further treatment.

This plant is capable of dealing with 1,575 tons of canes in 24 hours, representing a return of about 220 tons of cane sugar.

With the exception of the electrical plant the whole of the machinery, from the raw material up to the finished article, was manufactured in the shops of the Maschinenfabrik Haniel & Lueg, of Duesseldorf-Grafenberg.

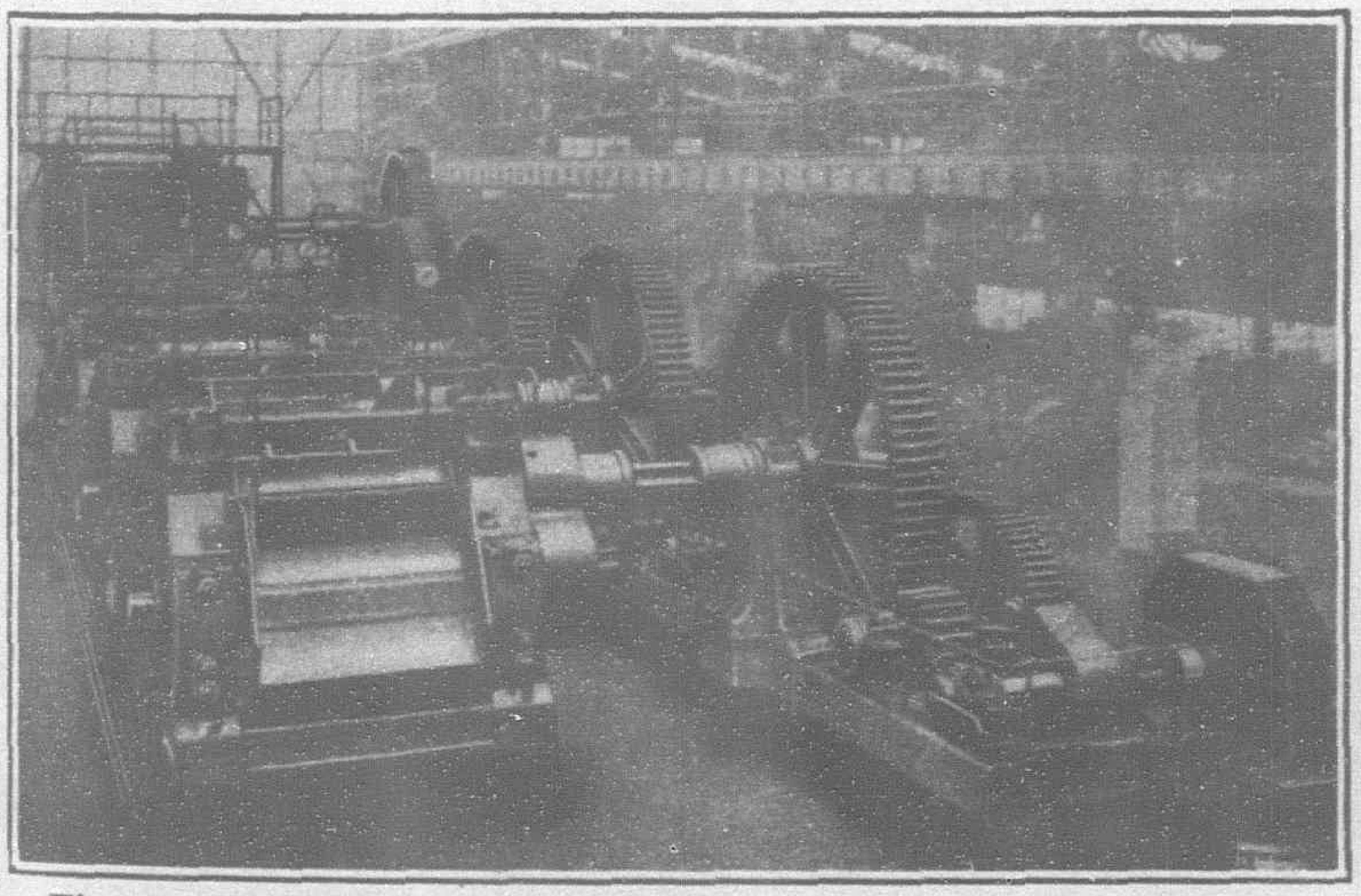


Fig. 4.—The Whole Train of Rolls in the Redjoagеng Plant, Seen from Feed Side of Preliminary Crusher

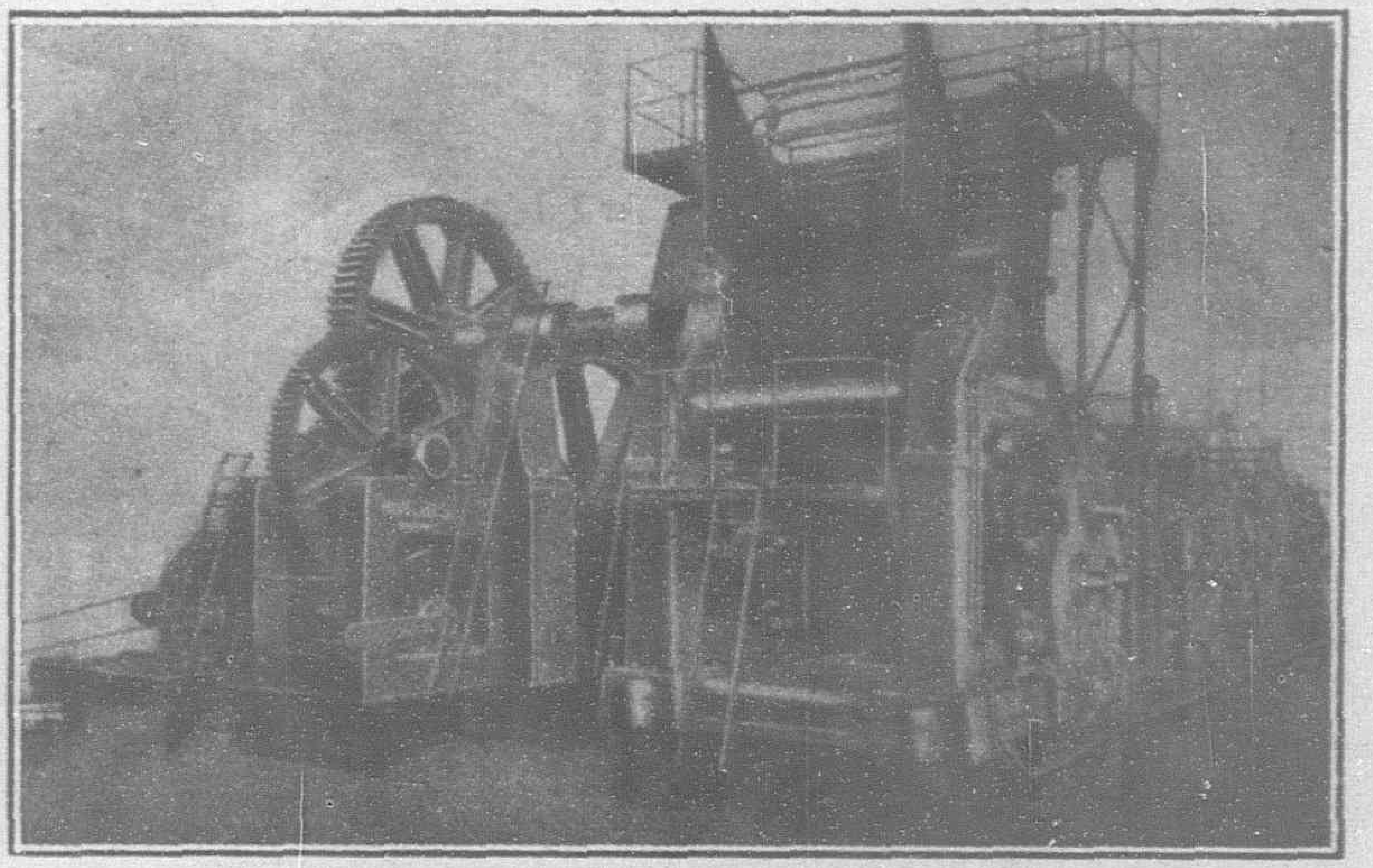


Fig. 5.—Sugar-Cane Mill, Seen from the Last Mill

Will Supply Power.—Negotiations for supplying 50,000 k.w. of power by the Nippon Electric Power Company, Osaka, to the Tokyo Electric Power Company have become unsuccessful. Mr. Yoshizo Ikeo, vice-president of the Osaka concern, frequently negotiated with Mr. Yasuzaemon Matsunaga, vice-president of the latter. The Tokyo concern found it unnecessary to receive such a large amount to meet the present situation. Consequently, the Nippon Electric Power interests have decided to ask the Ministry of Communications for the supply of motive power more than 50 horsepower per unit to such districts in Tokyo prefecture as Minami-Katsushika, Minami-Adachi, Toshima and Ebara The Nippon firm's large power stations capable of developing 50,000 k.w. at Yanagiwara along the Kurobe River in Hokuriku district are expected to be completed within the year. The erection of a transmission line between Kurobe and Tokyo, 166 miles, to carry 145,000 volts is in full swing.

Commercial Report Road Transportation in Southwest China

IN the absence of railroads in southwest China and because of road conditions, goods in transit are generally moved by pack animals or coolie power, though on isolated and infrequent plains and near the cities carts are used to some extent. These carts are very crude in construction, consisting of a simple wooden platform placed unsprung on an axle and wheels revolving as one unit. The axle is held in place between pins driven vertically into the sills of the cart and revolves against the pins. The wheels are made of planks cleated together and cut roughly to circular disks. The carts are equipped with shafts, and the motive power is one ox or water buffalo. Lack of cart roads precludes these vehicles from being used for more than local transportation, even if they were efficient. Long-distance freightage is entirely dependent on pack animals and coolie porters.

Pack Transportation and Animals Used

Where pack transportation is available, ponies and mules are used indiscriminately, ponies making up about 80 per cent of the total number. In certain sections of Yunnan and over large areas in Szechuan, the coolies' guilds refuse to permit competition from pack animals. In Yunnan the pack trade has been seriously damaged by commandeering of animals for military use, and owners are now most unwilling to bring horses and mules to the cities or hire, fearing their loss.

The southwest China pony is a sturdy beast of 12 to 13 hands height and an estimated weight of 400 pounds. It is unbelievably sure-footed and capable of great endurance but, because of its small size, has no great speed. Its ration is grain, hay, and bran, with beans frequently substituted for grain and bran, and it is usually allowed to graze at halts during the day. Mules conform in size, shape, and treatment to the ponies, but have proved incapable of carrying extremely heavy loads.

Pack Equipment

Equipment for pack transport consists basically of a canvas pad, stuffed with vegetable fiber in the form of an inverted " V " and shaped to the individual animal's back. This pad has wooden cleats and a wooden bearing plate stitched to each side. No girths are employed. The load rides by balance, and the saddle is kept from slipping on grades by chest and breeching straps attached directly to the pad-saddle. Movement of the saddle is neutralized by the chest strap working against a crupper strap. The crupper is generally of wood, with rotating wooden rings covering the bifurcation of the strap, and it invariably rests on a triangular felt pad. The breeching strap is prevented from dropping by strap suspension from the crupper. The pack itself is permanently lashed on a wooden frame that fits between the cleats and on the wooden bearing plates of the saddle proper. Unpacking is accomplished by lifting this frame entirely off the saddle. The animal's equipment is completed by a halterless headstall, and a rope or wicker muzzle to prevent grazing on march. Ponies and mules are invariably shod.

The tendency is rather to underload than to overload animals. The average pack is two coolies' burden, say 120 to 150 pounds. Because of the inherent slackness of the breast strap-crupper system, galling is frequent. Practically every animal is galled or has recent scars thereof. As everywhere in China, animals receive no consideration on this account while on march, aside from frequent inspection and restuffing of pads as a preventive measure.

Pack trains are made up of 20 to 100 animals, with one " mafoo" (packer, groom, horse attendant) to each three or four beasts. Mafoos usually carry light packs. The day's journey for pack trains and coolie porters is practically identical, say 20 to 25 miles, and marching times plus halts is about the same for trains and coolies. Pack trains usually halt twice in a day's journey. At these times packs, and sometimes saddles, are removed, and the animals are permitted to graze and roll. At these halts saddles are examined, stuffing readjusted, and lost shoes are replaced. No attempts are ever made at grooming, nor are blankets carried.

Man-Power Transportation—The Coolie

A considerable portion of goods transportation is everywhere handled by porters, and in many places they hold a freight monopoly. Porterage is usually done by contract, each man undertaking the delivery of his load at a point a given distance away Powerful porterage guilds exist in all cities, but non-guild coolies also are numerous. The porters as a class are young men, obviously vigorous and with specialized muscular development, notably large claves and heel tendons and big back and shoulder muscles. They usually have large pads of callous on a line across the shoulders and spine. Arms, wrists, and hands are usually underdeveloped. The coolies are invariably opium smokers, and most of their earnings are spent on this drug. Their equipment is simple—coat, trousers, straw sandals, rain hat, carrying tackle, and opium kit ; a turban, towel, and extra sandals are optional. They depend on inns for bedding, food, and opium, and hence the days' stages are clearly defined by the towns and villages that have these accommodations.

There is no way of determining the number of porters available in southwest China ; but considering the stability of the trade and the muscular specialization involved, their numbers can not admit of any great and sudden expansion. Carrying coolies usually travel in groups of 10 to 20 for company and mutual protection. It is quite common for the bearers of two or three different consignments to travel in company for days at a time. Porters' wages average about $1.50 per day and are paid in the currency of the region through which they travel. Bare living expenses take about 35 cents of this, leaving $1.15 for opium and display. They are thus, comparatively speaking a well-off, traveled, and ruffled caste. The use of opium and the dying away of its effects limit their working day to about 10 hours for carrying a 70-pound pack a distance of 20 miles.

Classes of Coolies and Their Relative Merits

Coolies are divided into three classes, according to their methods of packing, but specialization in one class by one man is rare. The classes are, as follows :

1. *T'iao-fu.*—These men carry their loads at the two extremities of a pole across their shoulders. The mechanical principle involved is that the pole springs rhythmically, and the coolie is able to advance in a cadence, moving forward when there is no weight on his shoulders, and bearing the full reaction of gravitation when his feet are on the ground. The cadence is, of course, a function of the length of the pole but averages about 75 per minute, permitting the coolie either a slow walk on grades or a dog trot on the level, according to whether he takes one or two steps between springs.

The limitations of packs (" t'iao-tzu ") carried by this system are : (*a*) Weight of load—not more than 90 pounds can be carried handily, and the average is around 60 ; (*b*) size of load—bulky, irregular, and unbalanceable articles can not be carried ; (*c*) weather—bad footing does not permit maintenance of cadence. Advantages of the system are : (*a*) Comfort compared with other methods; (*b*) speed—on fair ground the t'iao-fu makes about three miles an hour, uphill and down including rests.

This method is the favorite one for goods transportation among porters, although in many regions, especially in Szechuan where there is constant precipitation and muddy going, it gives way to the system described below.

2. *Pei-fu.*—These men pack their loads on their backs. Their equipment consists of a wooden frame, shaped in profile like a pair of sleigh runners, that extends from the level of the base of the spine to a line 4 inches above and directly over the top of the head. This frame is suspended from two vegetable-fiber straps that fit over the shoulders exactly as do those of infantry packs.

"Pei-tzu" (the loads carried on the back) are very difficult to get into, being put on while the carrier is in a sitting posture, and as it is practically impossible to remove them on the march, the pei-fu is provided with a one-legged stool, which has a boomerang-shaped top, on which he supports his load whenever he desires a rest. Pei-fu always lash their loads on the frames as high as possible, so as to get the center of gravity of the load directly over the center of gravity of the body.

Besides being able to carry very heavy loads, pei-fu are also able to pack bulky articles that can not be carrier by the t'iao-fu. A man has been seen with a load of reeds the top of which was at least 10 feet above the ground. They are reported to perform great feats of weight-carrying, sometimes as much as 400 pounds, but their normal loads average 60 to 80 pounds. Excessive weights are not incredible, however, if short stages and slow progress are granted. Pei-fu are slower than t'iao-fu, provided always that the road is dry.

3. *T'ai-fu.*—These men carry one load between two or more coolies, either lashing their cargo to a frame or, if the load is very bulky, attaching two-men poles to the corners ; for example, pianos and organs boxed have been transported, in this manner, a 12-day journey over the mountains. A load up to 180 pounds, lashed in the middle of a bamboo frame and carried by two men, would seem to have all the advantages of the "t'iao-tzu" and none of its drawbacks, as the t'ai-fu, by changing their distance from the load, are able to damp the rhythm or adjust the cadence to suit the footing. All the t'ai-fu observed have finished their day's journey more quickly and in better condition then any other porters making the same stages. But, because of the individualistic nature of the average coolie this method of transportation is not popular and is only used for freighting when the t'iao-tzu and pei-tzu forms of packs are impracticable.

Passenger Transportation

The t'ai-fu, however, are essential to passenger travel in chairs. These chairs are of two general types, the mountain chair and the sedan. The mountain chair is essentially a narrow oblong bamboo frame, with the traveler's bedding suspended in the middle across two poles. The traveler sits on the bedding dangling his legs over the front pole and supporting his feet on a stick suspended crosswise from the frame. An oilcloth covering is placed on bows over the bedding. This type of chair is very comfortable, is obviously light, and has the advantage of transporting traveler and baggage at the same time. It is awkward, however, to use more than two t'ai-fu with a mountain chair ; hence, travel in these chairs is limited to passengers weighing 140 pounds or less.

The sedan chair is of standard construction, made either of bamboo covered with oiled paper or of woven cane. It is thus much heavier than the mountain chair, say 40 pounds as against 15 pounds including bedding, and required three or four bearers. These bearer chairs usually have a pair of men in front and a single coolie behind, burdens being equalized by placing the rear carrying bar at twice the distance of the front crossbar from the chair's center of gravity. When four bearers are used each pair walks in file, one pair before and one pair behind the chair.

Handling chairs requires close teamwork from the bearers in the matters of balancing, keeping step, starting and stopping, and changing shoulders. Chairs make the same stages as do t'iao-fu and the baggage t'ai-fu.

King Chong Paper Powder Manufacturers.—On account of business expansion, the capital of the King Chong Paper Powder Manufacturers, 1341 Hsiang Lin Li, Boone Road, Shanghai, was recently doubled. Cake powder, talcum powder, tooth powder, facial cream, attar of roses and other kinds of hair oil, hair lotions, glycerine, and paper powder are among the articles manufactured. They are exported to Tientsin, Peking, Hankow, Canton, Swatow, Amoy, Singapore, Java, Siam, etc. The ingredients used in making cosmetics come mostly from America, Germany, and Austria. The paper powder, however, is a purely Chinese made article, and discarded negative plates of photographs are utilzied in making mirrors for the paper powder pads and books. The company also operates a book-binding department for book-binding, printing gold letters on book covers, and manufacturing diaries, note books, and pocket folios. The company is owned and managed by Fan Ta-chang.

Book Reviews

CHINA AS A TEA PRODUCER, by Boris P. Torgasheff: The Commercial Press, Ltd., Shanghai.

Mr. Torgasheff's volume on China is important in that it brings together within the compact form of a single volume, much valuable information with regard to tea production in China. For those interested in the economics of China, who desire information with regard to the cultivation and marketing of tea, the book will prove invaluable until a better one is written. Mr. Torgasheff is rather unfortunate in his limited knowledge of the English language. The reader is confused by a constant mixing of tenses, so that it is sometimes difficult to know whether events which occurred five years ago are still happening. This is particularly true of the study of the tea market in Hankow and Kiukiang, which are described, at times, in the present tense while all the world knows that they should be very much past. A little editing would have assisted Mr. Torgasheff.

Mr. Torgasheff is a competent student of economic subjects, having been Commercial Attaché to the Russian Legation in Peking during the end of the Czarist régime and at one time, special lecturer at the National University, Peking.

THE GENEVA OPIUM CONFERENCE, being a collection of Chinese statements by Dr. Alfred Sze: John Hopkins Press, Baltimore, 1926.

Dr. Sze's book, as a propaganda document, is important only in that one can easily avail himself now of the documents, which otherwise are scattered through the columns of the daily press. As a statement of the truth, however, one must turn to his introduction, where such a statement as the following is really unworthy of a man of the high moral calibre of Dr. Sze :

"As to measures thus to be taken by China, the Chinese delegation took early occasion to point out to the Conference that its Government still adhered rigidly to the policy of absolute prohibition of the production and use of opium in China and the limitation of its importation into China to amounts needed for strictly medicinal and scientific purposes, and that from this stringent policy its Government would not depart. The Chinese delegation frankly recognized that owing to disturbed political conditions in China there had been, to a certain extent, during recent years a most regrettable illegal recrudescence in China of the production and use of opium, but gave formal assurance that, at all times, and in all feasible ways, the Government of China would, to the extent of its administrative and executive power, seek to secure effective enforcement of its policy as thus declared. In this effort, the co-operation of the other Powers was asked for in so far as they could give it by effectively suppressing within their own several territories the use of prepared opium and the exportation of raw or prepared opium."

The basic fact of the opium problem is that China is raising 15,000 tons a year, that the militarists are financing their wars by the forced cultivation and sale of opium and that the sole political importance of Shanghai is the fact that it is the center for natively-grown opium or opium smuggled across the borders by Chinese. This fact is so glaringly open that the Nationalist Government, which is candidly realistic, legitimatizes the sale of opium and puts the money into its national treasury. One super-tuchun is reported to have made $40,000,000 a year out of the opium trade in the five provinces under his jurisdiction and has been able to fight an expensive war without taxing the people or borrowing because of his opium treasury. If Dr. Sze were really a brave man he would face the opium facts of China candidly and then all the world would be with him. If opium is a poison, then it should be suppressed and prohibited everywhere. But if opium is to be damned if grown in India and cherished if grown in China, then there is much intellectual dishonesty behind the sickly sweet fumes.

The manner in which the Coal Strike has drawn attention to the importance of oil fuel and the interest which is being displayed in the question of cheap electricity, leads us to feel that many readers would be pleased to receive a copy of The new Vertical Oil Engine Catalogue issued by Ruston & Horns by, Ltd., which bears Publication No. 5004. Engineers will be interested in recerving Copies of this Catalogue.

The Degeneracy of Manchuria

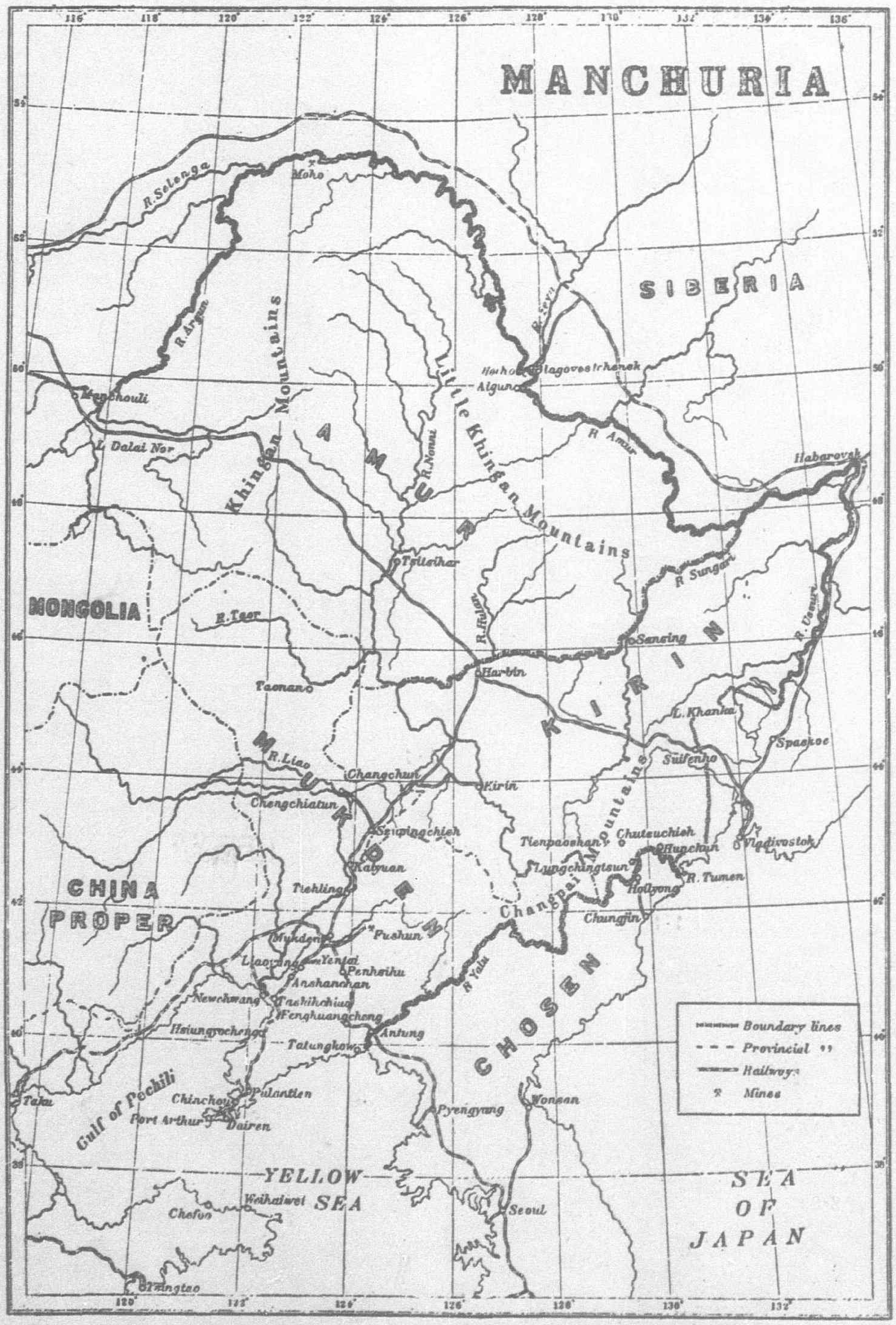
By Our Own Correspondent

MANCHURIA which during many years past has occupied an outstanding position among the provinces of China as a peaceful and thriving region, is now apparently drifting rapidly into a condition where its march of development is being checked and where it may even retrograde. This is due to the fact that the political and military adventures of Chang Tso-lin south of the Great Wall require the outlay of vast expenditures, and to meet these the Manchurian authorities are adopting a variety of means for stripping of silver the unfortunate provinces under their care. During many years past the government of Chang Tso-lin has been almost unique in China in that it kept the Three Eastern Provinces free from war, encouraged development and trade by refraining from imposing the numerous imposts which are so common elsewhere, and paid far more attention to the observation of treaties than was done by other provincial governments. Manchuria was one of the last provinces to refuse to pay its salt revenue to the Peking Government and it collected no likin. Imports landed at the Open Ports of Dairen, Antung and Newchwang were given exemption certificates which allowed their entrance free from further charges within the "Open Ports" in the interior, such as Mukden and other large centers, while goods destined to other points were charged only a three per cent. transit tax. Under these conditions merchants knew exactly what their expenses would be, trade prospered, and a confidence was felt in the government which contributed to the general prosperity and development of the country.

Now all this is being rapidly changed. The paper currency which has never been any too stable, is now an entirely uncertain quantity owing to the issuance of vast quantities of unsecured paper notes and, still more, to the enactment of grotesque regulations. with respect to currency and imposts on merchandise which are disrupting the economic life of the provinces. Apparently the authorities are possessed of one sole aim, namely the stripping of Manchuria of all the silver possible, and the fact that they possess no financial knowledge, blandly disregarding the most simple principles of economics, causes the regulations which they issue, from time to time, to produce conditions far more serious than would be even drastic taxation carried on along rational principles. This has led to a point where the government of Manchuria, which has in the past been very favorably considered by foreign residents—in fact, the foreigners were probably its most enthusiastic supporters—is now being regarded with growing distrust and disapproval, even to the point where foreigners who are utterly opposed to radicalism, communism, and all the rest of the impedimenta of Soviet influence, in China, have been heard to consider whether Cantonese control of all China, including Manchuria, might not in the long run be beneficial.

"The Cantonese are pernicious, but they are intelligent," is the way in which a prominent American in Mukden expressed this view. "They are clever enough to realize that foreign business in China is useful to them, as was shown when they insisted that the foreign banks and business houses in Hankow be reopened. They understand economic principles. The Northerners are both pernicious and stupid. They have not the slightest knowledge of economics and follow courses which are bound to be ruinous even to themselves. And one can't tell them anything."

As a matter of fact, compared with the lot of the residents of most other parts of China, the inhabitants of Manchuria have much to be very thankful for. There is no fighting within its borders, the train services, both Chinese and Japanese, operate efficiently and regularly. Order prevails, with the exception of the fairly widespread operations of brigands, but these have always



A Few Years Ago, the Wealthiest Area of China existed and have no great bearing on foreign business. Riots, mob violence and great strikes are almost unknown. The evils which are worrying the foreign residents are almost purely economic and in the main they will affect principally the Chinese population, which is so ignorant that it fails as yet to realize what is happening to it. Collection of taxation on imports is in itself not very serious, as the importer can meet that by raising prices, so that in the long run the consumer will pay the bill. Even the decrease in purchasing power which this will involve, does not constitute any very serious menace. The danger which is now creeping on Manchuria lies in the fact that the producing wealth of Manchuria is being employed by the government to finance its machinations outside of Manchuria, and that the Three Eastern Provinces are being left with a vast flood of paper money which has virtually no reserve of silver behind it and which must inevitably, if the present course of administration continues to run along its present lines, degenerate rapidly into almost complete worthlessness.

The Corner on Money

Generally, the aim of the authorities in the various localities is the same, namely that to strip the population of as much of its wealth as possible. The means employed differ, though all of them favor indirect taxation which, though far more stringent, is not so noticeable to the ignorant masses as direct taxes would be. The most drastic scheme is that inaugurated some months ago in Harbin, the most important center for the north Manchurian trade in beans and other produce. Here a local paper dollar constitutes the Chinese currency. It is issued by half a dozen Chinese banks, more or less connected with the government. In the past, this currency has not been particularly bad as far as exchange value was concerned. In fact, a year ago the local dollar stood at 1.10 as compared to the Japanese silver yen, but recently these banks all began to issue great quantities of new bills backed by very scant reserves of silver. The worst feature of the matter lies in the fact that no one, probably not even the administration itself, knows the extent of this issue. Various authorities give wildly differing estimates, ranging from 30,000,000 to 60,000,000. "The only guide we have is furnished by the numbers on the bills," said the manager of one of the foreign banks. "And, of course, that is not at all reliable. Personally, I believe that about $40,000,000 in paper has been issued, with about ten per cent. silver reserve. But that is mere guess work. It may be much more. A committee of bankers asked the government to give us accurate information, but our request was ignored. We have not the slightest idea what that paper may be worth or what it may fall to if this issuing of paper continues."

The consequence has been that the Harbin dollar is fluctuating wildly. It has not become very low as yet—its present value ranges at about 80 to the yen—and it has benefited by the recent rise in silver. The point is that it seems likely to follow the fate of the Mukden dollar, the so-called "fengpiao," which has fluctuated from between 54 and 650 to the yen during the past seven years, the present rate being usually over 600. In Harbin in the past merchants, Chinese as well as foreign, adopted the expedient of dealing in the Yen which was used extensively in all kinds of transactions. Under these circumstances the risk of the uncertainties of the Chinese paper issues might be avoided by using yen or any other foreign currency, but this avenue of escape was soon cut by the Harbin authorities who accompanied the issuance of their new paper with a drastic regulation forbidding the use of all foreign currency altogether. In Harbin to-day no Chinese or foreigner not having extraterritorial rights is allowed to accept foreign currency of any kind or even to keep it in his cash drawer. A number of persons who have been caught having such by the numerous spies who have been appointed to enforce the regulation, have been promptly jailed. This has happened to many Chinese and unfortunate Russians, one of the latter being the manager of one of the largest hotels. Foreigners, having extraterritorial rights have not been molested, but to all intents and purposes their money, be it sterling, U. S. dollars, yen, or any other currency, is of no value in Harbin until it had been exchanged for Chinese currency, leprous-appearing rags of paper, often so dirt covered as to be unreadable, which is probably the filthiest currency in the world. As Harbin is one of the great travel transfer points, where travelers from the Chinese Eastern express coming from Europe change for the southbound express, such suffer great inconvenience, as they cannot get a meal, a bed, or even a cab ride until after they have changed their money for local bills.

At first glance, it would not seem that these regulations, inconvenient as they are, might have great effect on the economic situation generally, especially as the Chinese farmers in the outlying districts have never seen foreign currency. In fact, they do not even know the Harbin dollar, but use a still more problematical paper currency, the Heilungkiang "jao" which has a far lower value than the Harbin issue and which has for many years been regular only in the steadiness with which is has dropped in value from year to year. The Chinese peasant is entirely ignorant financially. In fact, if he gets 100 jao this year for an article for which he received only 70 last year, he is inclined to think himself in luck, even though the purchasing power of his money has dropped. The Manchurian farmer is different from his brother in the south in the fact that he has a higher standard of living. He spends his money and does not save it, and the constantly developing productivity of the whole territory seems to furnish the only explanation why the bottom has not dropped out of everything long ago.

In the past, however, the Harbin money has, as has been stated, been a quite respectable currency—at least, as compared with that of Mukden and some other parts of China—but what is worrying the bankers and merchants is the debacle which seems inevitable now that the authorities have become entirely reckless in their issue of paper. Furthermore, the main point in the entire situation does not lie so much in the mere issue of a currency which is likely to become little better than fiat money, but in the fact that the government has adopted a very ingenious means for securing silver for its paper. Silver is needed for the Manchurian operations outside of Manchuria. Obviously this could not be obtained in any large amount by trying to exchange the paper for silver, which would soon send the entire issue tumbling. So the government has gone into business. It buys, with its paper money, great quantities of produce, which it sells for silver at Dairen or at points outside the Three Eastern Provinces. In other words, the government takes the produce, gives the population paper, and in consequence the silver which would normally come into Manchuria as a result of the sale of its produce, is diverted into the government's pockets and spent outside of Manchuria, with the result that, if this game is carried to a conclusion, the population will find itself stripped of its products and having no silver but only a lot of paper of problematical value.

The Curse of Paper

It is here that the principal objection of the foreign trader comes in. He can see what is coming, and even to-day the exporter finds himself sadly hampered in a competition for buying beans and other produce when he must compete with government banks which can issue paper ad libitum. On the other hand the importer must meet the drop of currency values by raising prices and in some places the authorities have tried to prevent that by regulations. Prices have risen especially in Mukden Province where the currency, the fengpiao, has dropped phenomenally during the past year. Here no restriction has been placed on the use of foreign currencies, through drastic regulations were issued to regulate exchange rates. At one time, Chang Tso-lin even executed summarily a number of Chinese brokers who had violated the rates arbitrarily fixed by the government. In spite of this the fengpiao has tumbled at such a rate that even where the farmer receives a far greater number of fengpiao for a unit of produce than he did formerly, the purchasing value of such has dropped faster than such increase. A case of oil which three years ago cost 8 fengpiao, now costs between 40 and 45. As a consequence the sale of this commodity has dropped in some districts by as much as 25 per cent. The people are going back to the use of rush lamps using native oils, and this is but one example of how the reckless financial operations of the Manchurian government is serving to turn backwards the heretofore triumphant progress, towards modern civilization of the Manchurian population.

Forecasts as to what will be the eventual result differ widely. White Russians resident in Manchuria predict that this region will see a repetition of what has happened in Russia. "When the Soviet issued floods of worthless money, the farmers simply produced enough for their own needs and raised no crops for sale," they say. "That is what the Manchurian peasant will do." On the other hand, old foreign residents argue that the psychology of the Chinese farmer and that of the Russian differ materially, and that the former will find a way out of his dilemma where the latter simply threw up his hands.

"When the Chinese farmer finds that the paper money is no good, he will refuse to accept it and will revert to barter instead," said the manager of one of the biggest American import concerns in Manchuria. " As a matter of fact, something like that is already taking place in many places. We demand payment in yen from our agents and many of these, who do not wish to take chances with the vagaries of Chinese currency, take beans instead of money for our goods. The beans they send to Dairen and sell them for yen which they remit to us. The system is spreading more and more and when the currency becomes worse and when the farmers awaken to the situation, we shall simply see Manchuria go back to a primitive barter trade. The farmer will sell his beans for cloth, kerosene or tobacco, and the paper money will presumably become even less valuable than it is now."

Another new feature of the economic situation of Manchuria is the recent decision to collect charges on imports through refusal to recognize the exemption certificates issued at the ports once the regular duty has been paid, which until now have exempted such goods from paying additional charges when brought into the " Open Ports " inland. A detailed outline of this situation would be too involved for description here, as it involves treaty rights, diplomatic discussions and the like. It may suffice to state that recently the Mukden authorities announced that all goods entering the Chinese city at Mukden must pay a tax of 3.3 per cent.—though why this particular rate was fixed on seems uncertain—and that exemption, certificates would no longer be recognized. The various consuls immediately protested, arguing that this amounted to rescinding the treaty declaring Mukden and other points " Open Ports." The Mukden authorities passed the buck to Peking, and Peking passed it back to Mukden. Protests were of no avail. Furthermore, conflicting announcements by the authorities have made it very uncertain as to how the tax will operate or be collected. The Japanese merchants, who have been principally affected, managed to force some goods inside the walls, but it does not seem that much good was accomplished by this, as the Chinese do not care to buy goods which have no stamp showing that the tax has been collected, with the consequence that they may be made to pay it later. In fact, the Chinese recently showed their resentment at the admission of Japanese goods which had paid no tax, whereas they themselves have had to pay tax, by instituting a campaign directed at the local Japanese merchants, though not at Japan generally, as the Chinese now propose to order their purchases direct from Japan so as to thwart the Japanese middleman in Mukden.

Foreign merchants explain that they are affected by the uncertainty, of the situation rather than by the charge of the tax, which could be added to the price of the goods if the extent thereof could be known. The point is, however, that, as is so often the case in China, the Chinese propose to enforce principles or regulations without having sufficient experience to provide adequate machinery for their enforcement. Collection offices are scattered at many points on the highways, but the collectors have no idea as to how to charge. An American firm conducted an experiment by sending in various directions carts, all loaded with exactly the same amount, kind and value of goods, and the charges which the collectors at the various points tried to collect varied absurdly. They had no idea of the basis on which they must assess the tax, and even when some of them decided to assess on the basis of the valuation assessed by the customs at Dairen or Newchwang, they did not have sufficient education to make the calculation necessary to convert the Haiwkan taels, charged by the customs, into local currency. Furthermore, different rates are charged at different points. Some charge 3.3 per cent., other 2.5, others still other amounts, and some nothing at all. As a consequence it is impossible to figure what will be the cost of goods delivered at any point in Manchuria. The authorities, sit tight and disregard all protests, suggestions and advice. Trade is being held up, and it is likely, if the present impasse should continue, that soon all imports will be sold from the points of landing or from the railway zones to the Chinese who will then have to take the chances with the vagaries of official high finance.

As has been stated, the foreign merchants object less to the tax than to the chaotic conditions which lack of intelligent enforcement, has caused. The Japanese, who are the main general importers, have been the loudest in their objections, and the Japanese authorities who have taken a lively interest in the matter, take the point of view that less objection lies in respect to the amount of tax involved than to the fact that the manner of its institution and collection constitutes a direct violation of the treaties. As is their point of view with respect to the general customs 2½ per cent. surtax, thus they explain, in the case of the Manchurian imposts, that the principle is to them the main point. In other words, if breaking of treaty provisions is allowed in this case, it will establish a precedent for further treaty infractions, so that eventually imposts, taxes and various regulations in restraint of trade may multiply to the point where the prosperity of Manchuria, which has been built up largely through foreign commerce and intercourse, fostered by law and order provided by the authorities, may go glimmering.

A new regulation which also illustrates the penchant of the Chinese in Manchuria to make regulations without providing for their observance or enforcement, is that which calls for all persons entering and leaving Harbin—except Japanese, who have a special reciprocal arrangement with China whereby neither Chinese or Japanese traveling in these countries need passports—to show Chinese visas on their passports. The legality of this regulation is questionable, to say the least, as the foreign consuls all claim that such visas are not needed, and the British consul in Harbin has filed a protest. At the same time, Chinese police demand such visas from all travelers, though it must be said that they are entirely courteous and even allow them to proceed on the promise that they will obtain such later. Evidently the game is to obtain another source of revenue from visa charges, such is gained from Russians and other nationals possessing no extraterritorial rights. Such persons are subjected to much inconvenience in this respect. It usually takes them weeks to get a visa even to travel from one point in Manchuria to another, and the charges are entirely arbitrary, poor persons being let off with a few dollars while wealthy Russians are often made to dig up several hundred dollars. The ludicrous part of the matter lies in the fact that no machinery has been provided to issue such visas for the traveler entering Harbin—and he is asked for his visa at Kwangchentze, some 150 miles south of Harbin, at the very beginning of the southern branch of the Chinese Eastern Railway, and the authorities at other Manchurian points in the South have apparently no knowledge whatever of the Harbin regulation.

As has been shown above, in their frantic efforts to obtain funds with which to finance adventures outside of Manchuria, the Manchurian authorities are continuously inventing new schemes for collecting revenue, some of them plainly illegal, some of them certain to cripple seriously the economic condition of their territory, and all of them so unintelligently administered that they cause untold impediments to development, trade and travel, but, as the foreigner quoted above stated, they stubbornly refuse to listen to reason, and it is evident that conditions are being created which cannot but slow down seriously the progress which has in the past made Manchuria conspicuously prosperous as compared with the rest of China.

Big Power Station Contract.—The General Electric Co., Ltd., whose head office is at Magnet House, Kingsway, London, have secured from the Birmingham Corporation the contract for the whole of the power house equipment for the new Hams Hall power station, in conjunction with the International Combustion Co., Ltd.

The G. E. C.'s contract includes: Two 30,000 K. W. turbo-alternators with condensers; two 1,875 K. W. house service turbo-generators with condensers; two house motor generator sets; the complete e.h.t., h.t. and l. t. switchgear equipment and transformers, and the whole of the power house cabling.

The value of this contract is some £500,000, and practically the whole of the machinery required will be manufactured at the G.E.C. works at Witton and Erith. It is interesting to note that two 30,000 K. W. sets will be the sixth and seventh large sets manufactured by this company for the Birmingham Corporation, the previous five sets having been installed during the past four years at the Corporation's Nechalls station.

In the boiler house, five of the largest water tube boilers yet constructed in this country, each having an evaporative capacity of 20,000 lb. per hour, are to be installed. The working pressure of the boilers will be 375 lb. per sq, in. and they will be operated with pulverised fuel firing equipment, all manufactured by International Combustion, Ltd., under the "Lopulco" patents. The "Lopulco" water-cooled furnaces will form an important feature of the steam generating equipment, and air heating by means of the "Usco" plate type air heater will be used throughout in connection with the preheating of air for combustion.

Japan Develops Steel Sheet Industry

Prospective Doubling of Capacity and Recent Continental Competition May Decrease American and British Sales

By George S. Herrick in the Iron Age

IN recent years, particularly since the Armistice, Japanese consumers have been heavy buyers of light gage black sheets. While consumers in the United States seldom use thinner than No. 28 gage, Japanese merchants and the extensive galvanizing industry that has been established in the past few years have been large consumers of Nos. 30 and 31 gage black sheets, which are generally rolled on a tin mill.

Specifications for these sheets may be roughly divided into two classes: sizes and gages used by the galvanizing plants for corrugated sheets and the size used for the plain galvanized product, which is also sold in small lots from warehouse stocks. For corrugating, the sheets are only 30-in. wide, but are 72-in., 84-in. or 96-in. long. These are generally purchased by the bundle of 224-lb., the 30 by 72-in. size being specified as 33 and occasionally 28 sheets to the bundle; the 30 by 84-in., 28 and sometimes 25 to the bundle, and the 30 by 96-in., 25 and occasionally 17 to the bundle, the number of sheets governing the gage.

For use as plain, box-annealed black sheets, or plain galvanized sheets, purchases are confined to 36 by 72-in., with 13 sheets to the bundle of 107-lb. Of the large total consumed in Japan, it is conservatively estimated that the galvanizing plants take close to 90 per cent, most of the remaining sheets being retailed out of merchants' stocks by the sheet.

American Sheets of High Quality

In the immediate post-war years the American product enjoyed the distinction of being considered by the Japanese purchasers as the highest quality and to a certain extent this reputation for quality stands to-day, Eagle brand, the product of the United States Steel Products Co., as a rule selling in the Japanese domestic market at slight advances in price over competing brands. In the past few years, however, British mills, until quite recently the only competitors for this business of mills in the United States, have established a reputation for several British brands that are to-day considered on a par with most of the American product.

The galvanizing industry, which has grown rapidly during the past few years, aided in no small measure by an almost prohibitive tariff on galvanized sheets, is by far the largest sheet consumer. Under the new tariff schedule, effective March 29 of this year, galvanized sheets are dutiable at Y.2.85 per 100 kin, or, at the present rate of exchange, about $22.50 per gross ton. Black sheets until the present tariff, which is extending considerably greater protection than former tariffs to the growing sheet industry of Japan, have been dutiable for only a small amount. The present schedule imposes a duty of 0.30 to Y.1.10 per 100 kin, or from about $2.35 to $8.70 per gross ton, depending upon the thickness of the sheets.

Large Number of Glavanizing Plants

There are 35 or more galvanizing plants in Japan; 10 or more in the Tokio district operating a total of 26 pans; 7 or more in the Osaka district with 21 pans, and 2 in the Yokohama district with 4 pans. Among the principal factories in Japan are the following:

Tokio District
Tokio Galvanizing Co.
Osaka Teppan (Tokio plant)
Jycto Galvanizing Co.
Kashiwa-Shokai
Nakayama-Noboru
Nakayma-Shigetaka
Toa Galvanizing Co.
Taisho Teppan Co.
Nattori Galvanizing Factory
Tokio Totan

Osaka District
Nippon Aento
Osaka Teppan
Dog Hira-nami
Hinode Aento
E. Nakayama Shoten
Amagasaki-Kogyojo
Inui Tessen

The monthly capacity of these plants in both districts is about 24,000 tons, but at this writing only about 50 per cent of the total number of pans are in operation. Even this rate is evidently considered too high, for limitation of the monthly production is being discussed as result of the depressed market conditions, and as low as 30 per cent operation is considered in some quarters as sufficient. This would be about 8,000 tons of sheets a month. It is suggested that to obtain this curtailment all plants should discontinue operations for about 10 days of every month.

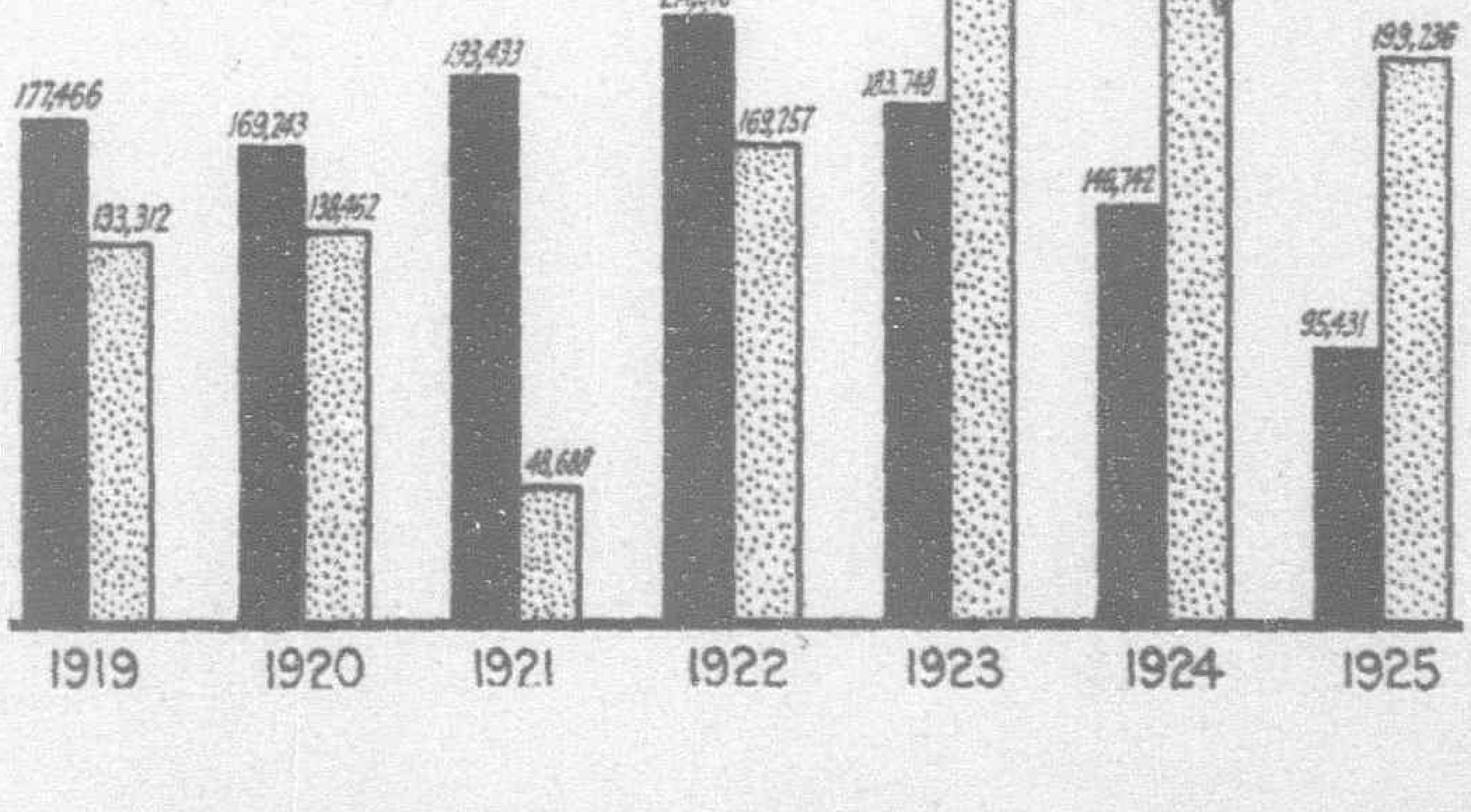
The products of the various galvanizing plants are in almost all instances marked with brand designations such as Red Pigeon, Swallows, Sparrows, Butterflies, Pheasant, Mandarin Duck, Crane, Dharma, Eagle with flag, Elephant, Horse, Lobster, Porgy, Swan, Plover, Dog, Green Tiger, Ship, Concentric circles and numerous other insignia.

Until recently either British or American black sheets were used in the production of these galvanized sheets, the Japanese industry buying increasing tonnages each year, as the industry developed and expanded. In 1920 the combined exports of black sheets to Japan from the United States and the United Kingdom totaled 84,578 gross tons; in 1921, 143,715 tons; in 1922, 215,463 tons; in 1923, 247,684 tons, and in 1924, 260,705 tons. It is noteworthy, as the accompanying chart shows, that, while there was a steady increase in the total consumption of black sheets over this period, the exports of the United States declined as the British exports increased, and those of Britain declined when American shipments became greater. The exports of 1924 possibly marked the high point in the combined sheet exports of the two countries, for 1925 shows a total of only 125,669 tons, and with developments in the Japanese sheet producing industry, and the recent appearance of Continental competition, the high total of 1924 may not again be equaled.

United States Exports of Black Sheets

Year			To Japan, Gross Tons	Total, Gross Tons
1913	...	...	1,236	132,919
1914	...	...	—	—
1915	...	...	—	—
1916	...	...	—	—
1917	...	...	—	—
1918	...	...	53,858	163,420
1919	...	...	38,118	177,466
1920	...	...	53,723	169,243
1921	...	...	127,626	193,433
1922	...	...	159,092	214,916
1923	...	...	74,757	183,748
1924	...	...	101,606	148,742
1925	...	...	38,234	95,431

Black Columns Represent American and Gray Columns British Exports of Sheets



United Kingdom Exports of Black Sheets

Year			To Japan, Gross Tons	Total, Gross Tons
1913	...	...	6,863	68,152
1914	...	...	—	53,927
1915	...	...	—	—
1916	...	...	—	—
1917	...	...	—	—
1918	...	...	—	115,397
1919	...	...	—	133,312
1920	...	...	30,855	138,462
1921	...	...	16,089	48,688
1922	...	...	56,371	169,257
1923	...	...	172,927	284,901
1924	...	...	159,099	246,756
1925	...	...	87,435	199,236

Both the galvanizing plants and the merchant buyers of sheets generally buy certain brands or the product of certain mills which rank high in their estimation. In the case of purchases of sheets from mills in the United States there will sometimes be preference for the product of the United States Steel Products Co., or the Bethlehem Steel Co., the Youngstown Sheet and Tube Co., or the Wheeling Steel Co. Numerous British mills are reported among the sellers to Japan, and practically all their products are brand marked. An accompanying list includes the most popular British brands and the names of the manufacturers or distributers.

Analyses of German, British and Japanese Sheets

(Results of Tests in Japan)

Maker, Location	C.	Mn.	Phos.	S.	Si.	Cu.
Gelsenkirchen Bergwerks A. G., Germany	0.08	0.40	0.04	0.04	—	—
*W. Gilbertson & Co., England ...	0.09	0.42	0.18	0.09	—	—
Imperial Steel Works, Yawata, Japan	0.10	0.40	0.04	0.04	0.14	0.35
	0.18	0.50	—	—	—	—
Kawasakai Dockyard Co., Kobe, Japan	0.08	0.34	05.1	0.28	0.13	0.12
	0.10	0.36	0.60	0.31	0.85	0.14
Osaka Sheet & Plate Mfg. Co. Tokuyama factory)	0.08	0.40	0.45	0.03	0.01	—
	0.14	0.42	0.60	0.04	trace	—

Rolling Capacity Stimulated in Japan

The increasing demand from the Japanese galvanizing industry and other users in Japan has stimulated the development of a domestic rolling capacity, which is beginning to assume sizable proportions. For some time the Imperial Steel Works, Kiushiu, has been rolling light gage black sheets, but its capacity for this product is only about 10,000 tons a year. The Osaka Sheet and Plate Mfg. Co. operates a sheet mill at Tokuyama with a capacity of close to 10,000 tons, but the lightest gage that has been profitably produced is No. 28, so that it is not a serious competitor for the thin gage sheet business of the Japanese market.

About a year ago, however, the Kawasakai Dockyard Co., at Kobe, began to increase its small sheet capacity by the purchase of rolling mill equipment in the United States, placing orders with such makers as Mackintosh, Hemphill & Co., Pittsburgh, and the National Roll and Foundry Co., Avonmore, Pa. To-day the Kawasakai dockyard claims an annual capacity of about 35,000 tons of thin gage sheets and, with the completion of present installations some time in July, the total output of this one company, it is claimed, will be close to 95,000 tons a year. Thus far the Japanese industry faces one rather serious obstacle, the high cost of production.

Belgian and German Sheets Tested

In the meantime, although the Japanese have been developing a domestic sheet industry, there has been considerable activity in seeking new sources of supply abroad, and tests have been made on sheets of foreign manufacture other than American or British. Several months ago a trial shipment of Belgian-made open-hearth light gage black sheets was tested in Japan. The product was apparently found satisfactory, but these sheets were only 30 by 72-in., the smallest size used for corrugating. A few months ago, however, the Glesenkirchen Bergwerks A. G., Düsseldorf, Germany, shipped a trial tonnage of open-hearth steel sheets, made to Japanese specifications (36 by 72-in., 13 to the bundle of 107-lb.), and upon tests they were reported comparable in quality to the best British brands. The accompanying table shows the chemical analysis made of the Gelsenkirchen sheets compared with the British-made Comet brand and the products of the Imperial Steel Works, Kawasaki Dockyard Co., and Tokuyama factory.

Finishing Mills Being Developed

As a modern industrial nation, Japan has made tremendous strides during the past 15 to 20 years. The development of a sheet rolling industry is only a small part of the ambitious program being carried out in the Japanese steel industry. During the past few years wire-drawing plants have been growing in number and size, so that Japan has become a heavy buyer of wire rods in the world market and a smaller consumer of foreign wire and wire products.

British Brands of Black Sheets Sold in Japan

Brand	*Maker*
Comet	W. Gilbertson & Co., Ltd., Pontardawe, Glamorgan, Wales
Raven	Grovesend Steel and Tinplate Co., Ltd., Gorseinen, Glamorgan, Wales
Koto Morestead Special	Upper Forest and Worcester Steel and Tinplate Works, Ltd., Morriston, Glamorgan, Wales
Eclipse Flexum	Frederick Braby & Co., Ltd., London
Phoenix	Baldwins, Ltd., London
E. V.	Ebbw Vale Steel, Iron and Coal Co., Ltd., Ebbw Vale, Monmouthshire
Fan Dolphin	Partridge, Jones and John Paton, Ltd., Newport, Mon.
Harvest	H. B. Barnard and Sons, London
A. J. Co.	Arthur Jones & Co., (merchants), London
Sunflower	Burnell & Co., Ltd., Ellesmere Port, near Birkenhead
Samson	Melyn Tinplate Co., Ltd., Neath, Glamorgan
Staley Crown	John Summers & Sons, Ltd., Stalybridge
Marksman or William Tell	Bowesfield Steel Co., Ltd., Stockton-on-Tees
R. P. D. D. L.	Dorman, Long & Co., Ltd., Middlesbrough, England
Globe	John Lysaght, Ltd., Bristol
Dobbin	Brunner, Mond & Co., Winnington, Northwich, exporters
Stag	Wellfield Galvanizing Co., Ltd., Llanelly
Lily	Richard Thomas & Co., Swansea
Lily Crown	Miller, Gibb & Co., Liverpool, exporters

A few months ago it was authoritatively stated that the Imperial Steel Works would soon be in a position to supply the rail requirements of Japanese railroads for sections up to 80-lb. and part of the requirements for 90-lb. and heavier. On April 10 the Steel Manufacturing Encouragement Act, providing for a subsidy on molten iron produced from ore for immediate steel production, was made effective. In addition, the act exempts such producers for a period of 15 years from business profit taxes and import duties on equipment. A drastic duty on copper is developing the native copper mining industry.

Gradually, from a large importer of finished products, Japan is apparently slowly working into the position of an importer of semi-finished and raw products for conversion in its own finishing mills.

Japanese Land Ownership in the Philippines

WHILE President Coolidge is trying to work out some arrangement satisfactory both to the United States and the Filipinos, looking to restoration of co-operation between the natives and the government, a Japanese company complicates matters somewhat by dickering to buy a whole island of 15,000 acres not so very far from Manila, and in the direct line of communication between Japan and the Philippines.

It is hard to see why there should be any particular shouting against the purchase of the island. The President is preparing to give the islands a new deal, involving, according to reports, complete autonomy at an early date, yet, nevertheless, under the government of the United States. Capital is needed to develop the islands, and since it seems not to be forthcoming any too abundantly from the United States, why not from Japan, or Britain, or some other power? It will redound to the prosperity of the islands, and indirectly to the prosperity of the United States.

Negotiations are progressing looking to the sale by Vincent Masigan, who owns the island through inheritance from an original Spanish grant. Some not so trustful of the Japanese are already voicing their demand that Washington prevent the trade. Being so close to Manila and intense American supervision, it is hard to see how the Island of Fuga can be used other than for the commercial purposes the dicker sets out. No military use of the island is possible, for American officers can prevent the landing of any quantity of arms, certainly any long-range rifles that might make it unpleasant for the Island of Luzon at some future time. Nor can the 15,000 acres serve as a base of supplies. Why not let the trade go through and see what stimulus it proves to inter-island trade. It might wake up American capital and Filipino ambitions to take their rightful place in the sun.—(*St. Louis Star*)

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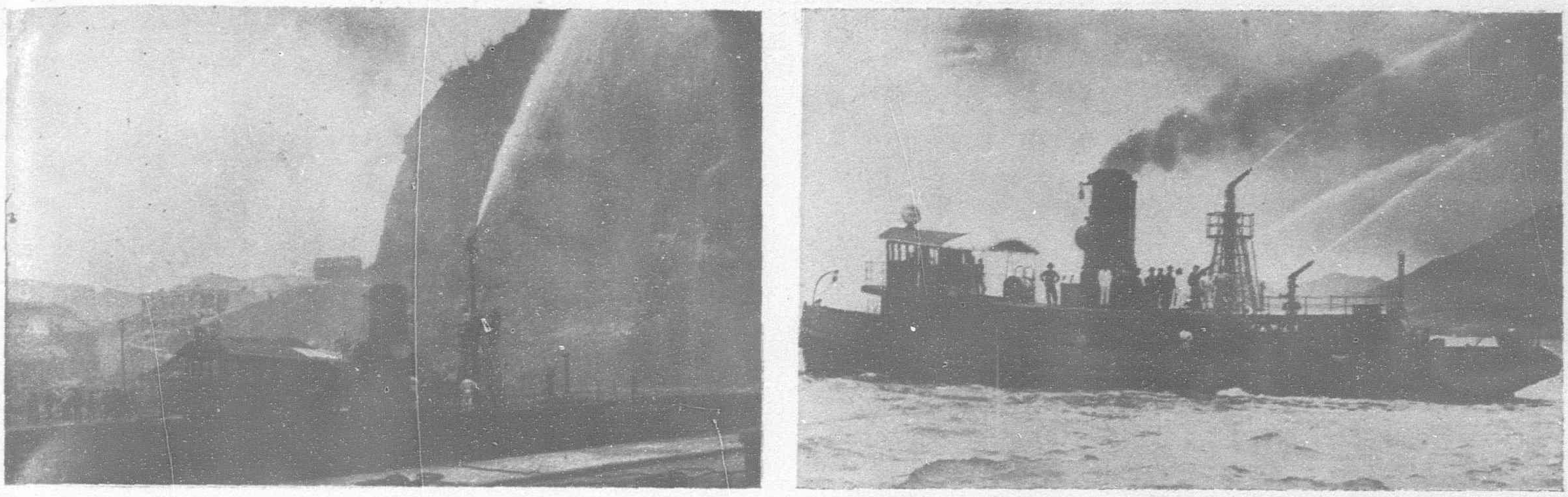
*Comet brand.

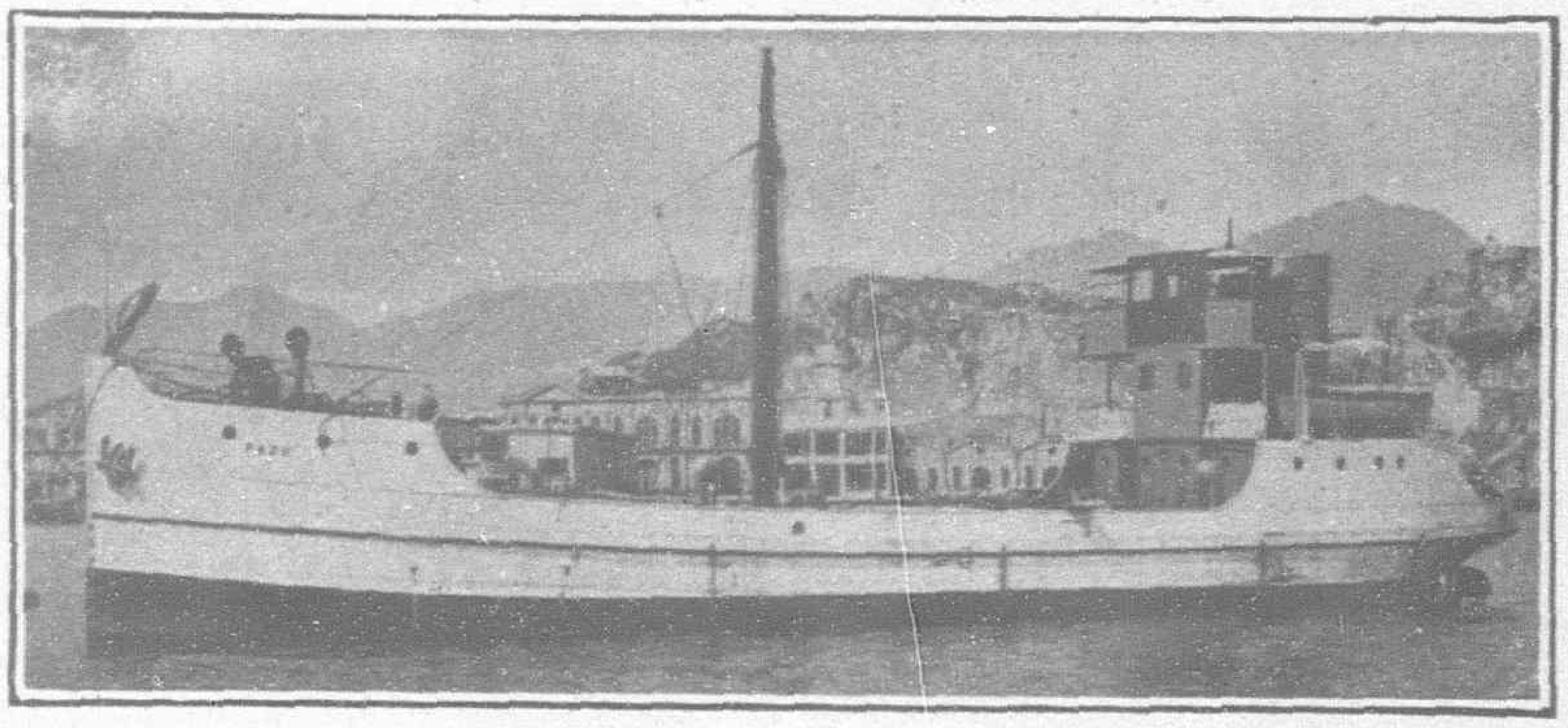


The Firefloat at Work

Firefloat for Hongkong

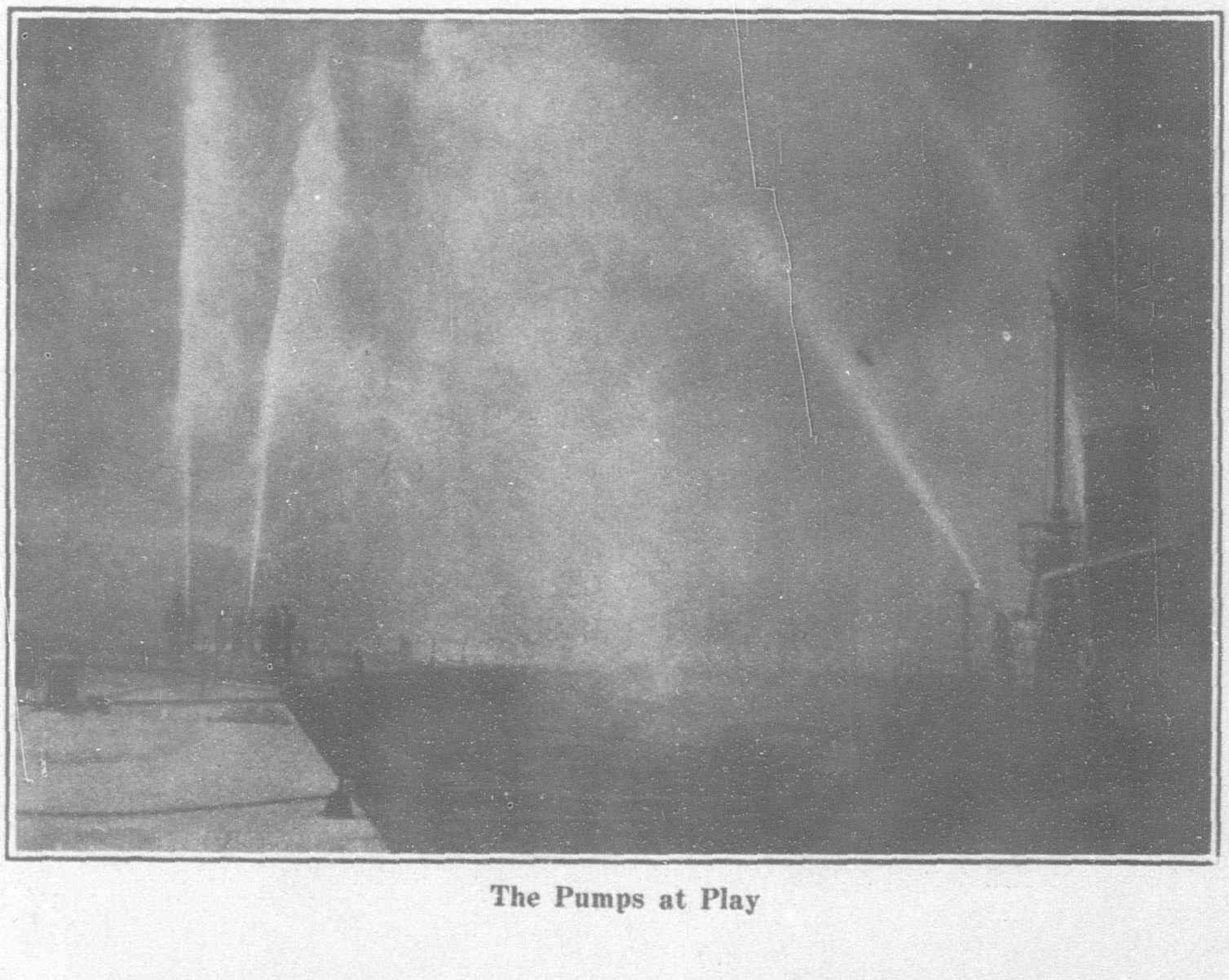
THERE has recently been completed by the Hongkong & Whampoa Dock Co., Ltd., to the order of the Hongkong Government, a firefloat which possess many features of interest. The principal dimensions of this vessel are:—

Length overall	101-ft.
Length between perpendiculars	95-ft.
Breadth, moulded ..	23-ft.
Depth, moulded ..	9-ft. 6-in.



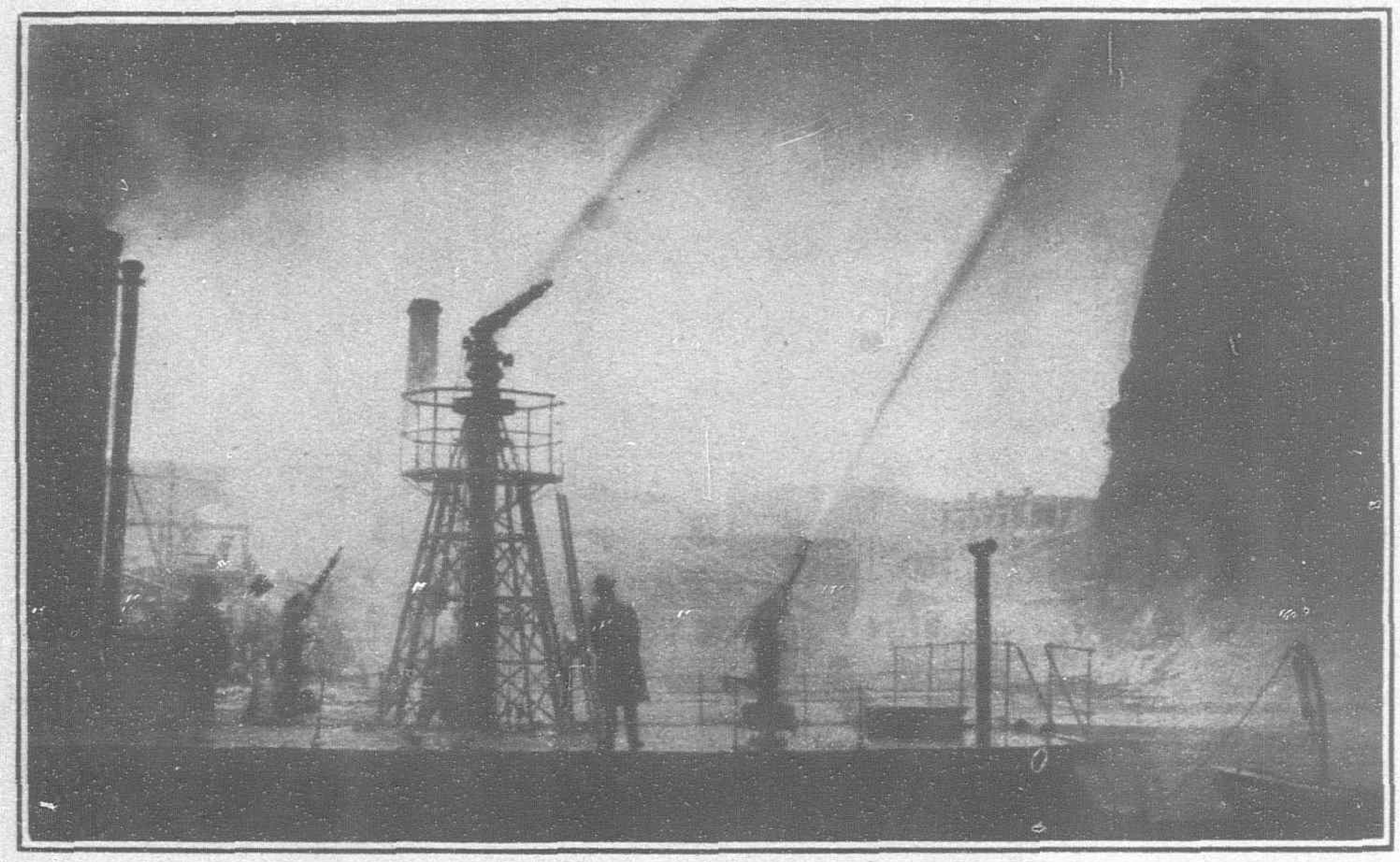
The Paz II

The hull is constructed of steel throughout, the principal scantlings being in accordance with the requirements for Lloyd's highest class for vessels of this type. As will be seen from the general arrangement drawings, the vessel has one steel deck sheathed fore and aft, over which for a length of 70-ft. is a wooden deck laid with 4-in. by 1½-in. teak on which are arranged the fire-fighting appliances abaft the funnel and the navigating bridge forward. The hull is divided into six compartments by means of five water-tight bulkheads, giving the fore-peak, chain locker and crew space forward, the machinery space which occupies the major portion of the space amidships, the captain's and engineer's cabin, and a store for the hose pipes etc., right aft. The vessel burns oil fuel under the boilers, this being carried in two tanks of 642 cub. ft., or about 16 tons total capacity arranged in the wings of the bolier room forward, while two feed tanks are fitted in the boiler room wings aft, these having a total capacity of 575 cub. ft., or about 16 tons. On the main deck below the navigating bridge there is the dining saloon, an additional cabin fitted with bath and w.c., while aft of the engine room casing is the galley and storeroom.



The Pumps at Play

PROPELLING-MACHINERY.—The vessel is propelled by a triple-expansion engine having cylinders 12-in., 20-in., and 33-in., diameter with a piston stroke of 21-in., receiving steam at a working pressure of 180-lb. per square inch. An independent air and circulating pump of Merryweather's make is installed, together with a bilge and general service pump and two Weir's direct-acting feed pumps. The vessel is lighted throughout by electricity, current at a pressure of 110 volts being supplied from a 5-kw. generator, which also serves to operate a powerful 18-in. searchlight containing a 2,000 candle-power gas-filled filament lamp and fitted with mirror and dispersion lens. Steam is supplied by two straight-tube express type water-tube boilers having a working pressure of 200-lb. per sq. in. and burning oil fuel under the pressure system, the oil fuel apparatus, comprising pump, heaters and filters, being installed between the boilers as shown in the drawings. The boilers work under forced draught on Howden undergrate enclosed direct system, the fan, which is 60-in. diameter and is driven by an engine having a



High Pressure Pumps on the Firefloat

single cylinder 5½-in. diameter by 4-in. stroke, being installed on a platform above the firing flat of the boilers. The rudder is controlled from the bridge by hand-operated gear through rods and chains to the quadrant-tiller on the rudder stock. A steam-driven windlass, is, however, fitted forward for working the anchors and mooring cables.

Fire and Salvage Pumps.—The fire-fighting equipment comprises two of Merryweather's latest pattern double-cylinder " Greenwich Gem " vertical fire and salvage pumps, which together are capable of delivering 4,000 gallons of water per minute at a pressure of 150-lb. per sq. in. These pumps, the cylinders of which are 12-in. diameter, are driven by engines having a cylinder 16-in. diameter by 8-in. piston stroke. The water is delivered through two gunmetal swivelling monitors fitted on the shade deck aft and one 5-in. monitor carried on a water tower built up of steel angle bars supporting a working platform 9-ft. above the deck level. In the interior of the delivery pipe to this monitor a telescopic steel tube is fitted operated by steel chains from the platform level, and which when fully extended brings the delivery nozzle to a point 29-ft. above the upper deck. In addition, provision is made for connecting hose pipes from the deck to the wharf when the vessel is moored, thus enabling an additional number of jets to be provided by the pumping equipment of the vessel.

During the course of the trials of the vessel, some 4,000-ft. of hose was laid out and an effective discharge of water to a height of about 150-ft. was made from the three monitors as well as from the nozzles on shore. The speed trials showed that the vessel was capable of doing 10.31 knots while sufficient steam is available for operating the salvage pumps while the main engines are in operation.

Motor Vessel "Aloha"

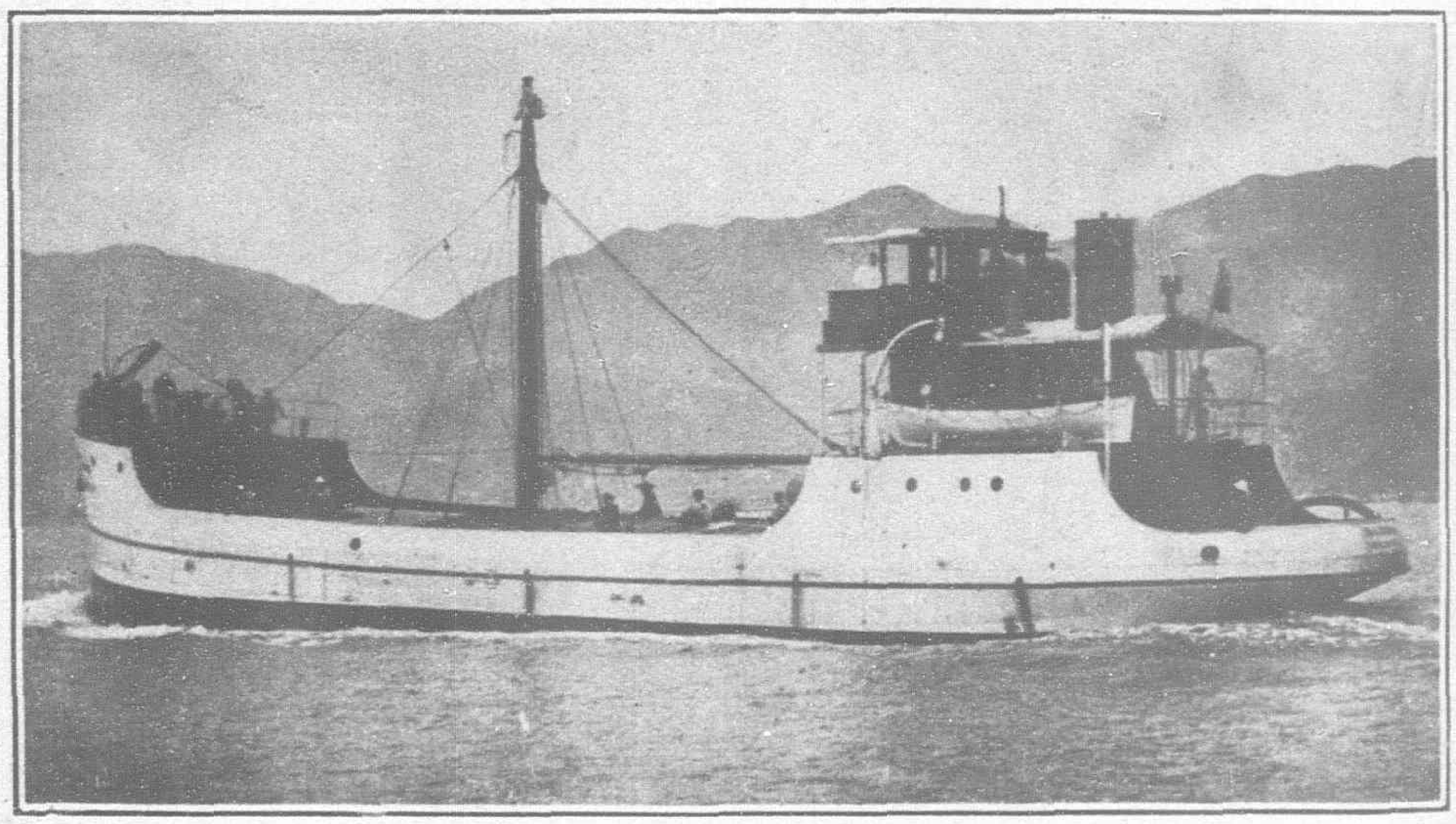
The *Aloha* which has just been delivered by the Hongkong & Whampoa Dock Co., Ltd., is the first of two sister ships built at Kowloon Dock to the order of the North Negros Sugar Co., Inc., of Manila.

The principal dimensions are as follows :—

Length overall ..	124-ft. 8-in.
„ B.P. ..	120-ft. 0-in.
Breadth Moulded ..	24-ft. 0-in.
Depth Moulded ..	8-ft. 6-in.

The vessel which is intended for the transport of sugar has been specially designed so that her draft when loaded with 150 tons deadweight shall not exceed 5-ft. 0-in. on even keel in F. Water, in order to cross the bar at the mouth of the river Victories, at the same time it was necessary to construct her to Lloyd's highest class so as to undertake the journey between Hongkong and Manila. The bottom of the vessel has been specially strengthened for the purpose of loading while aground.

The Machinery consists of one Atlas type F. 41 Genuine, Full Diesel Marine Engine of the two Cycle, air injection type, fitted with separate scavenging cylinders and direct reversible, Engine developing 160 B.H.P. at 250 R.P.M. with the necessary air receiver, silencer, fuel oil purifier, water filter, also one Engine driven auxiliary compressor and one Bilge and Ballast Tank.



The "Aloha"

Playmates All

Children the world over love dolls. In Japan the doll is elevated to a plane whereby parental and ancestral love and pride are fostered. Each third of March in that nation, the children hold the Festival of Dolls—a day when the dolls of mother and grand-mother and of more remote ancestors are arranged in serried rows for inspection and the renewal of acquaintance. The children and older people dress in gala costume. They compare their own dolls and visit the displays of neighbors. When all is over the manikins are put away for another year.

This March the children of Japan will have a new thrill. Hundreds of thousands of American-made dolls are soon to sail for that country. Dressed by American children, ticketed and given passports, carrying the name and address of the senders and a message of good will, these dolls will be received officially by the Japanese government and distributed among the children of that land. Dimpled, blue-eyed, curly, fair-haired dolls will take their place with the dark, slant-eyed, favorites of Oriental children. The flowered kimono and the dainty chiffon dress will make more real the dissimilarity of the two races. Yet under all will be the abiding reality of a human nature that makes kin of all the peoples of the world.

This unusual enterprise, fostered by the Federal Council of Churches, and now happily to be consummated with the sailing of these American dolls, is in the interest of international friendship through the children. There are probably greater gestures of good will that can be made by official congresses and diets than this writing simple participation in a national festival. But at the present we cannot think of one.—*(Newburgh News.)*

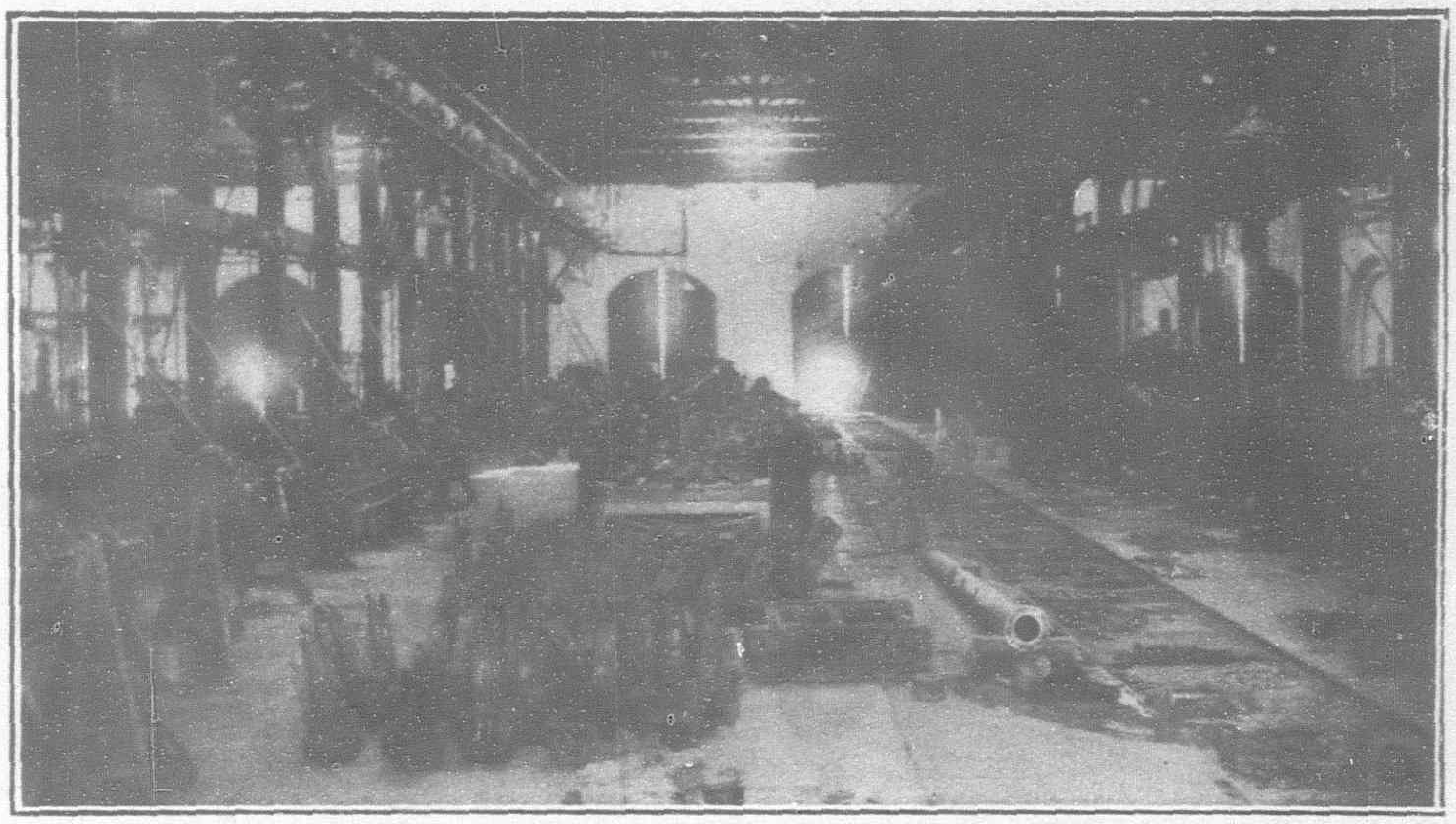
The Peking-Mukden Railway Workshops*

Tongshan Workshops and their Importance

THE Workshops are located at Tongshan, and together with storage space, repair tracks, etc., cover an area of about 400,000 sq. yds. Besides undertaking the repair and overhauling of all rolling stock on the line, the whole of the passenger stock is built here, and, until recent years, all freight stock, as well as a certain proportion of the locomotives, to meet increasing traffic demands.

The workshops are the best equipped on the Chinese Government Railway System and employ about 3,000 men. The works are under foreign supervision and are well provided with machinery.

Locomotive, passenger and freight stock has, in the past, been built for other railways in China.



View in Machine Shops, Tongshan Works

Materials Used

In building locomotives and cars, the wheels and axles, tyres, steel castings, couplers, springs, plates and sections in market sizes, and special accessories are imported. Local material is used when possible.

Practically the whole of the works machinery is electrically driven, power being generated on site, and the works are electrically lighted throughout. The water supply was a difficult problem, due to the fact that wells are the only practical available source of supply, and it was some years before good wells were located, which was first done by Mr. J. Turner of the Eastern Engineering Works. A 250,000 gallons, concrete, underground tank is utilised as a reservoir, and water is also stored in other three overhead tanks, with a combined capacity of about 90,000 gallons. Both steam and electric pumps lift the water to the requisite head.

Shops Described

A description of the principal shops follows, giving dimensions of buildings, machinery in use, and class of work turned out in each. Shops, stores, and offices are heated, the shops by the Sturtevant Hot Air System and the stores and offices by low pressure steam.

Loco. Works Machine Shop. This consists of three bays, the centre bay 50-ft. wide, and the two outer bays 65-ft. wide, with a common length of 240-ft. Tool store and casehardening room adjoin main building, as do also coppersmiths' and tinsmiths' shops.

The principal machines are 5 Wheel and Axle Lathes, taking up to 7-ft. dia. on tread, Frame Slotting and Drilling Machine for frames up to 40-ft. by 4-ft. 3-in., about 12 at one time for slotting and about 6 for drilling, Duplex Boring Mill for axlebox brasses, etc; Planing and Slotting Machines, taking connecting rods up to 9-ft. 5-in. crs; Radial drills, Tyre Boring Mill, Cylinder Boring and Facing Machine, taking up to 21-in. dia. by 28-in. stroke cylinders. Piston rods are turned and ground to size, and all motion work is ground also, including radius links. Slide bars and all motion pins are also finished by grinding.

Light overhead cranes are in use over the two outer bays.

Electric welding is used for repairing cracked cylinders, reinforcing piston rod ends and other worn parts.

Engines' Tenders

This shop takes care of all machining concerning locomotives and tenders, and a good deal of work is also done for shops plants and tools.

Casings, mouldings, pipes, lamps, etc., are worked in the coppersmiths' and tinsmiths' shops adjoining.

A hydraulic press for wheel mounting is arranged near the tyre heating shop, which adjoins the machine shop. Tyres are heated in an oil fired furnace, for shrinking on wheel centers.

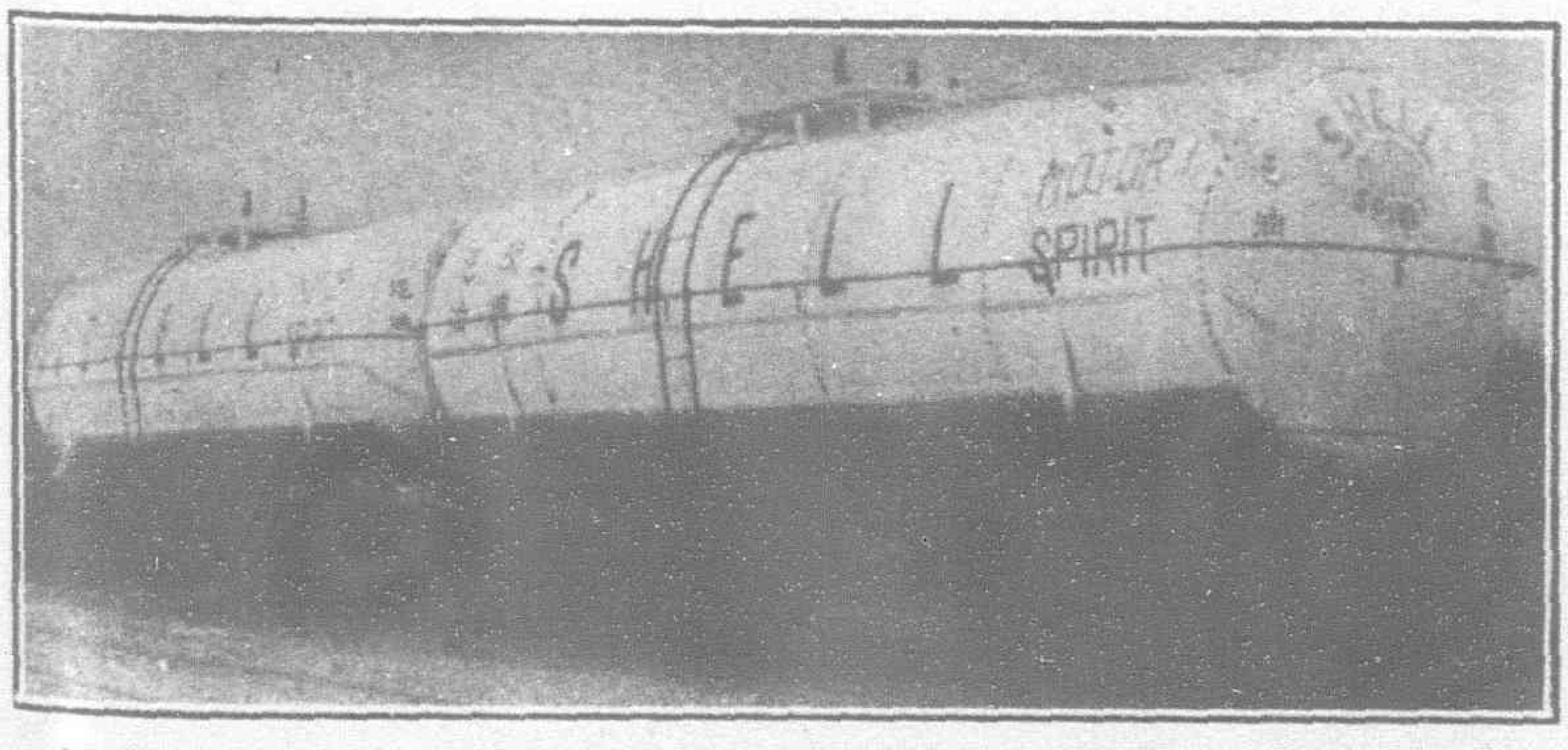
Compressed air is available in the shop, and hydraulic testing of valves arranged for.

The Boiler Shop

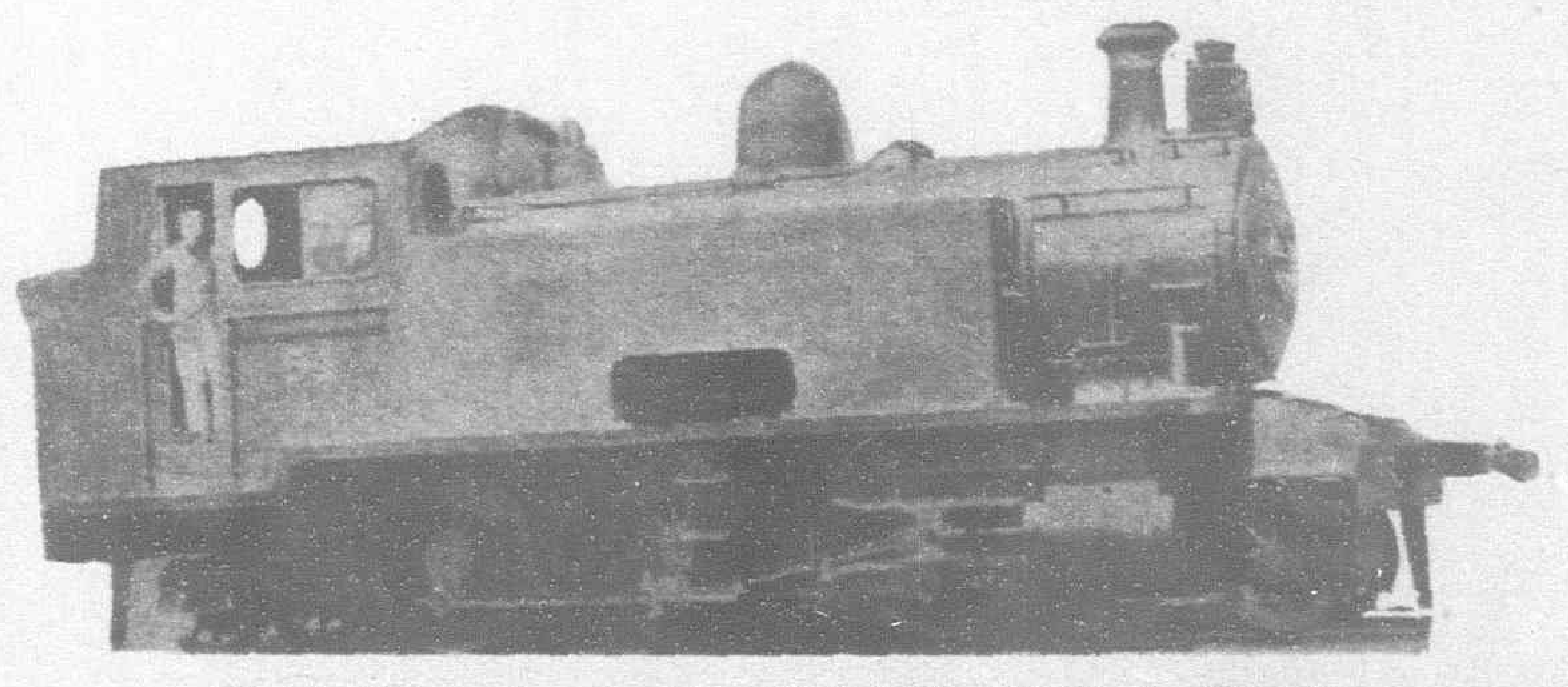
Boiler Shop. This consists of two bays each 50-ft. wide by 375-ft. long, together with a smaller shop for boiler testing, 52-ft. wide by 212-ft. long.

The boiler shell bay has a light electric overhead crane, and the bay handling complete boilers, an electric overhead crane of 30 tons capacity. Wall cranes are conveniently arranged for light lifts.

Machinery consists of Splitting Shears, the largest one taking 1-in. plate, Vertical Plate Rolls taking plates up to 12-ft. wide, and also Horizontal Rolls, Plate edge planing machine, Vertical Boiler Shell, Turntable Drilling Machine, Flanging Presses, Punching, Shearing and Cropping Machine, Radial Drills, etc.



30 Ton Capacity Benzine Tank Car Built in Works for A.P.C.



Heavy Shunting Loco. 10 Similar Built in Works

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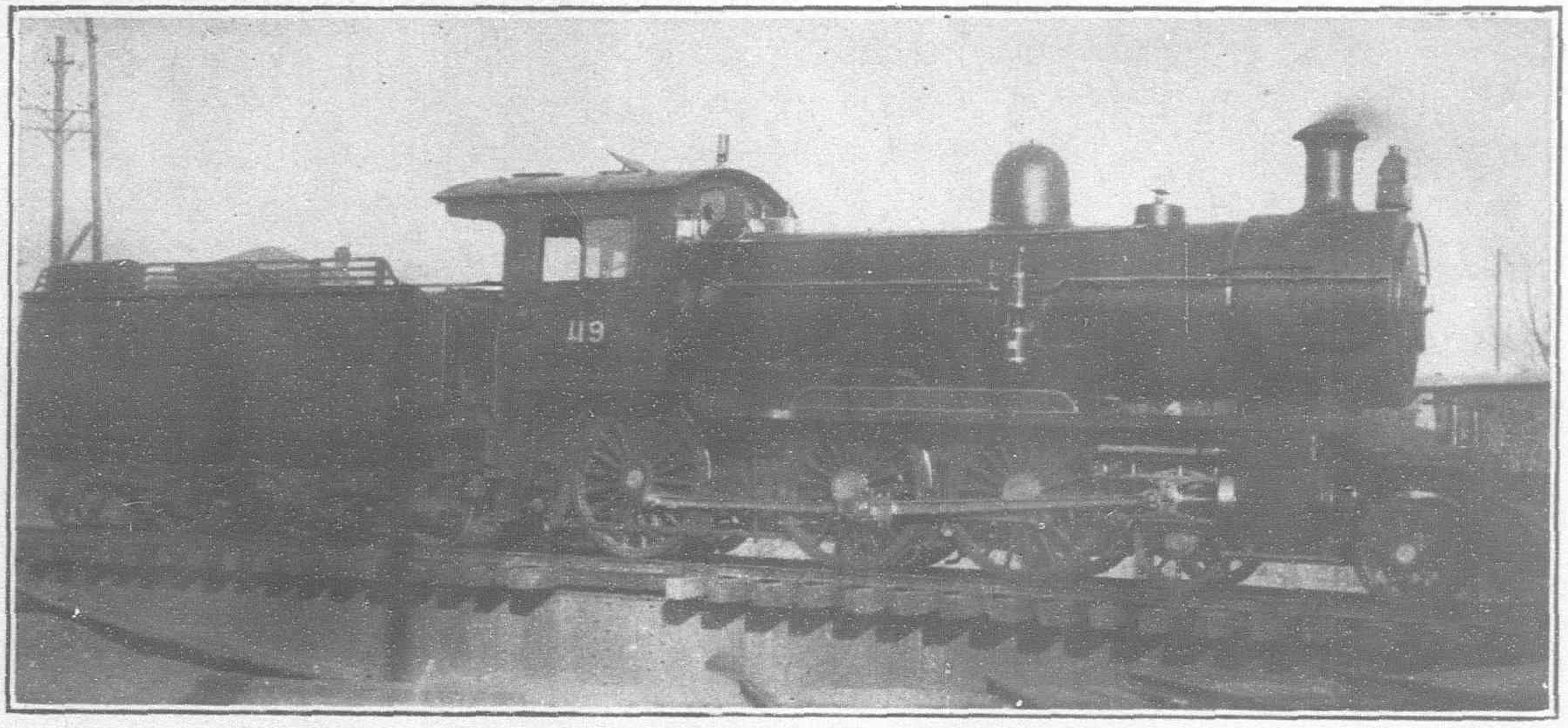
*Oriental Engineer.

View in Car Shops, Tongshan Works

Pressing Plates

In the large flanging press, smokebox tube plates ¾-in. thick and 6-ft. 3-in. dia., bogie frames ½-in. thick by 14-ft. 0-in. by 3-ft. 0-in., and tank car ends up to ½ thick by 8-ft. 6-in. dia. are pressed. A plate furnace is located near presses and can take a frame plate, if necessary, 40-ft. long by 4-ft. 3-in. wide, and also heat a plate 9-ft. by 9-ft.



Rebuilt Locomotive, Tongshan Works

A hydraulic riveting pit, with overhead crane, is provided and open air blown fires, for local heating of plates, etc.

Boilers for all classes of engines on the P.M.R. are constructed, the smallest being about 3-ft. 5-in. dia. by 15-ft. 5-in. long overall, with a heating surface of 552 sq. ft. and a grate area of 13 sq. ft. and the largest about 5-ft. 8-in. dia. by 27-ft. overall, with a heating surface of 2,241 ft. grate area of 41½ sq. ft. and being arranged with arch tubes and superheater flues.

Repair Work

Repair work forms a large part of the shops activities. Provision exists for repairing 10 of the largest boilers at one time and about the same number of smaller ones. Electric welding plant is used for re-inforcing thin parts of fireboxes, filling up cracks which develop in service, etc. Flue tubes are electrically welded over at firebox ends, after expanding and hydraulic testing.

The average life of a boiler is 18 to 20 years, but fireboxes require renewal about every 5 years, having had half sides once in this period.

Water at several points on the line is detrimental to firebox plates. A water softening plant is now installed at Kuyeh, and great improvement is already found in condition of boilers using the softened supply. Washing out and hot water refilling plants are in use at most of the loco. sheds and have a beneficial effect in keeping boilers in service by reducing tendency to scale and incidentally increase the available power by the quick turn round of engines.

Testing Boilers

The testing bay has pits for testing 4 boilers at one time and additional space for about 8 boilers, either under mounting or awaiting testing. Boilers are tested with hot water at 250 lbs. sq. in., and with steam to 180 lbs. sq. in., the working pressure. Smoke ducts, of ample size, are dropped over respective smoke-boxes, whilst boilers are under steam test.

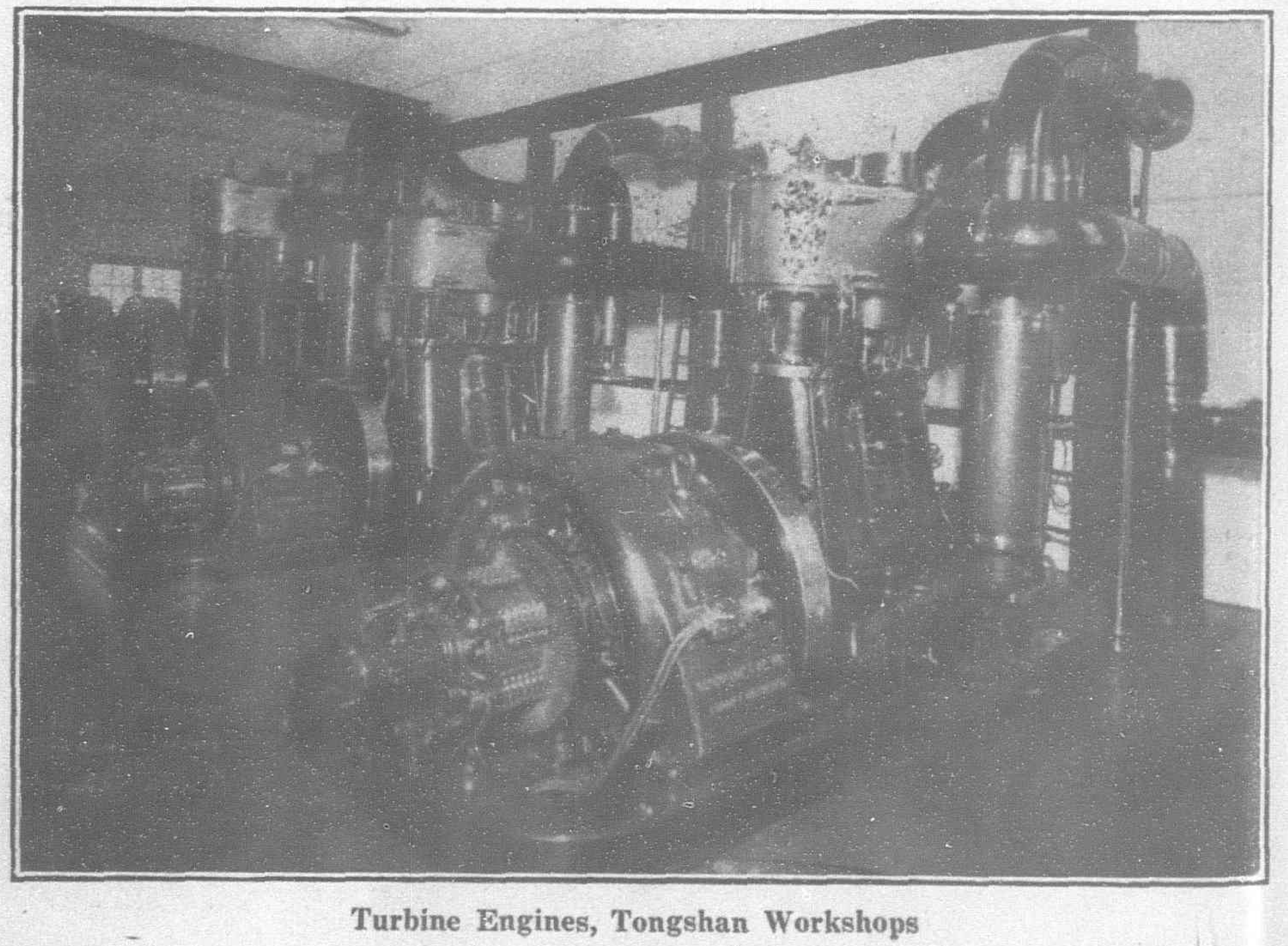
Automatic stay bolt machines are arranged as a group at opposite end of shop to testing pits.

Both pneumatic and hydraulic tools are used in the boiler shop.

The Tender Shop

Tender Shop. This is situated alongside boiler shop, is 260-ft. long by 52-ft. wide, and served with one 30 ton overhead electric crane. Pits are arranged, and provision exists, if required, for dealing with 20 tenders at one time. The standard tender in service carries 5,000 gals. water and 8½ tons coal on two 4 wheeled bogies and weighs 54 tons in working order.

Cabs, ash-pans, splashers, etc., are fabricated near the tender shop, and storage tracks for spare tenders, and those awaiting repairs, adjoin. A light transfer table, in shallow pit, permits tenders from erecting to pass shop approach to tender shop. Pneumatic hand tools are used throughout shop.



Turbine Engines, Tongshan Workshops

The Smiths' Shop

Loco. Smiths' Shop is 300-ft. long by 55-ft. wide and arranged with 33 fires, each served with draft through underground duct, by means of a motor driven blower. A spring tempering furnace is provided, and a shingling furnace and rolling mill, are, it is hoped, shortly to be installed, which will reclaim scrap material.

All ordinary locomotive forgings are worked, including crank pins, slide bars, foundation rings, coupling and connecting rods, piston rods, motion work, etc.

Steam Hammers available are 2-one ten, 2-ten cwts, and 1-five cwt. There is also one Hot Saw and one set Cold Shears.

Adjoining the Smiths' Shop is the bolt and rivet shop.

Five upsetting machines form the heads on bar up to 1$\frac{1}{4}$-in. dia. for bolts and 1-in. dia. for rivets. Heating furnaces alongside each machine obtain draft from three blowers.

Screwing and tapping machines form remainder of machinery.

Castings Made

Foundry. Iron Castings are turned out in the larger bay, which measures 260-ft. by 53-ft. and brass castings in the small bay, 100-ft. by 52-ft. The annual output is approx. 430 tons of cast iron and 100 tons of brass.

Such parts as piston valve cylinders, 21-in. dia. by 26-in. stroke, saddles and other usual loco. parts are regularly cast, the heaviest weighing about 40 cwts. Two cupolas with a combined capacity of about 6 tons are available.

For brass castings, a Morgan's tilting furnace is provided, of 400-lbs. capacity, and 5 other furnaces, having a total capacity of 20 cwts. of metal. The output consists of all brass fittings, valves, axlebox brasses, etc., usual in loco. and car work.

Constant Repairing

Erecting Shop.—The total number of locomotives on the line is 225, and about 10 per cent. are always passing through shops for general overhaul. This practically ensures every engine being dealt with, at interval of about 3 years. A general overhaul takes about 3 months, and an engine will usually run 150,000 miles between such overhauls.

The erecting shop has a capacity of about 25 locomotives and is 600-ft. long by 53-ft. wide in the main bay, two auxiliary bays being the same length by 21-ft. wide. The main bay had three tracks, the two outer being provided with pits, carried the whole length of shop, the center track, generally, being for movement.

Lifting Locomotives

Two 45 tons capacity, over head, electric cranes, with auxiliary light lifts, are used to lift engines from center track to alloted positions over pits. The heaviest locomotive is the Mikado class, weighing 81 tons in working order and 70$\frac{1}{2}$ tons light. There are twenty-three of these engines in service. Four of these locomotives were built at Tongshan, and four more are now under construction. The Pacific class, of which ten are in service, are of approx. the same weight as the Mikado class. Two are now being built at Tongshan. Other types built here, both for the P.M.R. and other Chinese Lines, are the heavy and light Mogul type for main line service, 53 of former and 21 of latter class, the more recent construction being fitted with superheaters and feed water heaters. For shunting, both heavy and light classes have been built, 11 of the former and 5 of the latter.

Electric welding and acetylene cutting are valuable adjuncts to the shop, such parts as broken frames, cylinders and covers, saddles, etc., being reinforced and repaired very quickly.

Interesting Tools

Tools of interest in the shop are cylinder and valve chest boring bar, motor driven, enabling parts to be re-bored and faced in place, an erecting block for erecting frames, ensuring correct transverse setting, and an axlebox guide facing machine, motor driven, also used on guides in place on frames.

One side bay provides facilities for work on springs and rigging, brake hangers, etc., and other details. The other bay is utilised for painting locos and tenders and as storage space for tenders and boilers awaiting repairs.

At the North end of shop, a flue shop 102-ft. by 61-ft. is provided, safe ending of large and small tubes and swaging down of tube ends being carried out on suitable machines.

A flue rattler displaces scale off tubes from service, and a large and small hydraulic tube testing machine is available, as well as a multiple spindle nut tapping machine, with a nut forging machine alongside.

Number of Cars

Car Works. Approximately 320 passenger and 4,300 freight cars are in service on the P.M.R., and all passenger and the greater number of freight cars, up to 30 tons capacity, have been built at the works. Of the passenger cars, the standard 1st Class is 65-ft., and the 2nd and 3rd Class 55-ft. over frames. The bodies are of timber, the under-frames being built up of steel. The 1st Class weighs about 40 tons, and the 2nd and 3rd Class about 25 tons. The freight cars are of 10, 20, 30 and 40 tons capacity. Open high sided cars are used mainly for coal traffic, built entirely of steel, or composite wood and steel construction. Covered cars are of 20 and of 30 tons capacity and are either all steel or composite wood and steel.

Flat cars, low sided, and 30 ton tank cars are occasionally built, and a 50 ton well wagon was recently constructed.

Capacity of Shops

The capacity of the car shops is 80 large passenger and 500 freight cars per year. Repairs work forms a large portion of the output, about 7 per cent. of the rolling stock always passing through the works for overhaul. Old stock is usually rebuilt at such times. Most of the freight cars are repaired on the open air tracks adjacent to the shops.

Every part of car is manufactured, except wheels and axles, tyres, springs, heating and brake equipments, and a few small accessories.

All passenger stock is fitted with the Westinghouse system of steam heating, when not equipped with a self-contained, and Westinghouse brakes.

The main shops consist of one row of buildings, comprising 16 bays, each 200-ft. long by 43-ft. wide. An electric traverser runs between these shops on the North side, and Saw Mill and Paint Shop on the South, in a shallow pit 780-ft. long by 55-ft. 10-ins. wide. The largest cars and, if necessary, locomotives can be taken by this traverser and moved to and from any shop desired.

Other Work

Car Works Frame Shop consists of 3 bays, one being arranged for heavy machines such as Punching Machines, Radial Drills, Shearing and Cropping Machines, Cold Saw and Plate Rolls. Axleboxes and brasses are machined 16 at a time, on planer.

Two 10 tons electric overhead cranes are arranged over the frame erecting bays and a light hand crane over the machines.

Hand pneumatic riveting and chipping and rivet burstingt ools are employed. The capacity of the shop is six-65-ft. frames at one time.

Car Works Smiths' Shop occupies 3 bays and is equipped with 64 air blown fires and two-10 cwt. and three-5 cwt. steam hammers. A Bretts electrically operated, drop stamping plant has been installed for mass production of repetition car parts, with falling hammers 7, 15 and 30 cwts. respectively.

The parts made include such forgings as truss rods, hand brake screws, brake block hangers, beam ends, levers and pull rods, bar frames, spring hangers, door fastenings, etc.

A coke fired case-hardening furnace is available, fitted with pyrometer.

The Machine Shop

Car Works Machine Shop is arranged in 3 bays, one bay with light overhead crane. Fitting benches occupy center of shop. Machinery consists of 8 Pillar and 4 Wall Radial Drills, Sensitive Drills, 2 Slotters, 3 Shapers, 2 Planers, Boring and Surfacing Machine, 2 Turret Lathes, 1 Capstan Lathe, taking bar stock to 2-in. dia. Heavy Car Brass Boring Machine, with capacity of 4 brasses at a time, Universal Milling Machine, many small General and Polishing Lathes, etc.

A drop testing plant, outside shop, is used for transverse testing of axles, the top being raised by means of a small steam engine.

Car Works Wheel and Axle Shop is in three bays, each 100-ft. long by 43-ft. wide, and is provided with facilities for turning tyres and journals of car wheels and axles, and for pressing and removing of wheels on and off axle seats.

The machines in use comprise two Wheel Lathes, three Axle Lathes, One Journal Grinding and Polishing Lathe, one Wheel Balancing Machine, Hydraulic Wheel Press, with 9-in. ram, and a 42-in. Car and Wagon, Putnam, Heavy Wheel Lathe, driven by 50 h.p. motor, the tailstock of lathe being operated by independent motor.

All operations of this Putnam lather are button controlled, and the machine can turn tyres of a pair of wheels simultaneously, at the rate of a pair per hour.

Wheels and Axles are raised and swung from one track to another at right angles, by air jacks, at three points in shop, instead of using turntables or crane.

Three hand worked 2 ton cranes are arranged overhead.

The Bogie Shop

Car Works Bogie Shop is arranged in two bays, each 100-ft. long by 43-ft. wide. There are several kinds of bogie in the P.M.R. service; a passenger car type with pressed steel frames, of 8-ft. and 10-ft. centers, and equalizing, a long bolster, and a built up type, termed the "Imperial," because first used under a car for the late Dowager Empress. Freight cars are fitted with either pressed steel framed type, with centers at 5-ft. 9-in., a M.C.B. bar framed diamond bogie, or a built up truss type, of local design.

Pneumatic hand tools are used in the shop, and the following machines are installed :—Radial Drills, Cold Saw, and Plate Planing Machine for bogie pressed sides. Two hand worked overhead cranes, of 4 and 2 tons capacity, run length of one bay, and a 2 ton crane in the other. A plate heating furnace is provided.

Arrangements are in progress to fit this shop with tyre heating furnace to shrink tyres on wheel centers. At present this is done in Loco. Machine Shop.

Various Shops

Carpenters' Shop is arranged in 6 bays, each 200-ft. long by 43-ft. wide. There is floor space, and equipment, to have 18 bodies of 65-ft. passenger cars in progress at one time.

The method adopted is to build up the bodies on horses, about 1-ft. from floor, and when complete, the whole is jacked up, steel underframe on bogies is run underneath, and bodies bolted down. The car is then completed on the spot, no overhead crane being used during operations.

There are two light cranes used for lowering heaters, etc., into cars. Pneumatic drills for holes up to 1-in. dia. are used for timber drilling.

Tailors' Shop, 150-ft. long by 42-ft. wide, is situated next to Carpenters' Shop. All upholstery work on car seats, berths, etc., is done, as well as lagging for heating boilers and pipes. Equipment consists of a number of sewing machines, electric irons, and a teasing machine for renovating horsehair.

The Paint Shop is situated opposite to Carpenters' Shop on the South side of traverser. It is 200-ft. long by 129-ft. wide and contains 6 tracks, with a capacity for about 15 cars, 65-ft., and 55-ft. long, at one time. Temperature of shop is kept at an even point for drying by the Westinghouse method.

Adjustable platforms, at sides of tracks, give easy facilities for painting and washing down cars.

Saw Mill

The Saw Mill is parallel to the Paint Shop and is in 3 bays totaling 129-ft. wide by 200-ft. in length, and is a well lighted and open shop. The whole of the machinery, as far as possible, is driven from underground shafting, shafting and motors being arranged in shallow pits. Belting and drives are generally out of sight and in all cases guarded. The arrangement gives plenty of floor space and room around machines to swing timber during the various operations. The floor is of concrete.

A steam driven log saw takes timber up to 3-ft. square, to cut into standard planks, and is the only steam driven machine in the shop. A 2-ton overhead crane running to outside of shop transports logs to machine.

Other machines comprise 3 Circular Saws, 3 Planing and Surfacing Machines with auto. feed and 2 with hand feed ; 2 Double Spindle Circular Moulders, 2 Planing and Moulding, 2 Wood Turning Lathes, Tenoning Machine, Copying Lathe, Blind Style Mortising Machine, Chain Cutting and Mortising Machine, Hollow Chisel Mortising and Boring, 2 Moulding Machines, Auto. Gaining Machine Roller Feed Saw Bench, Band Saw, and a Single Speed Boring Machine.

Steam Drums, outside Saw Mill, are used for bending hoop sticks intended for car roofs. A timber Drying Shed is also available.

Air Brake Shops

Westinghouse Air Brake Shops.

A repair shop 50-ft. by 42-ft. is maintained for complete repairs to whole of Air brake equipment. A testing rack is arranged with facilities for testing 6 pumps at a time, steam being obtained from a stationary boiler.

Air is compressed and used in shop, being independent of other supply.

A test shop, 240-ft. long by 25-ft. wide, near track entrance to works, is used for complete train testing, the shop being a through one with single track.

In this shop there is a complete engine equipment for auto. and non. auto. working, arranged for drivers' instruction. A passenger car testing set is also arranged.

The steam heating of a train may also be tested at the same time as air brake equipment.

The rolling stock, in the future, is intended to use the double brake, and many of the freight cars are at present so fitted, but only automatic working is in use.

Heavy shunting locomotives do, however, now use the double brake.

Boiler Houses

Loco. Works Compressor Plant and Boiler House.

The equipment includes
1 Ingersoll Rand Compressor 12-in. by 10-in.
3 Chicago Pneu. Compressor 10-in. by 10-in.
2 Tongshan made Compressor.
All these are steam driven.

A hydraulic accumulator is installed and two horizontal duplex pumps.

The boiler house contains 4 sets of Babcock Wilcox water tube boilers, of 983 sp. ft. heating surface each, with space for an additional set.

Power House Boiler House contains 5 sets of Babcock Wilcox water tube boilers, of 983 sq. ft. heating surface each.

Car Works Compressor and Boiler House.

Compressor equipment consists of.... 1 Chicago Pneu. Compressor 10-in. by 10-in. 1 Consolidated Pneu. Compressor 10-in. by 12-in.

Both are steam driven.

The boiler house contains 4 Lancashire boilers and 1 set Babcock Wilcox water tube boilers, of 983 sq. ft. heating surface.

Stores Kept Full

Stores. All loco. and Car parts are stocked that it is usual to renew. Large parts such as wheels and axles, tyres, couplers, rough brass, sections, brick arches, brake blocks, beams, etc., are stocked in store yard.

The main store building is 410-ft. long by 33-ft. wide and is fitted up with concrete shelves and binns throughout, the binns being sub-divided when desirable.

A portion of the store is given over entirely to Westinghouse brake and heating equipment spares.

Floor space is available for spare side rods, motion bars, springs, casings and such parts, too large for shelves.

Another store building, 200-ft. by 54-ft., is used to store tubes, plates, angles, superheater elements, bars, blooms, etc. Pits are sunk into floor about 2-ft. deep, and tubes, bars, etc., carried upright in pits. Racks above and between pits keep stock in position.

Oil is stored in a separate building, fitted with tanks, near store.

100 in Offices

Offices. A two storied building contains the running department, clerical and drawing office staff, totalling about 100.

Apart from design of locos and cars, a considerable amount of work is done for loco sheds and works plant. Materials are tested on a machine fitted up in store.

The drawing office is provided with arc lamp printing frame, a photostat machine for direct reproduction, a photograph room, an oil testing bench, and a full sized model for laying down the Walschaert Gear.

Tongshan Running Shed is 272-ft. by 98-ft. 6-in. inside and was built in 1908. Six tracks enter at one end, spaced at 15-ft. -9-in. centers, and are arranged with pits 3-ft. deep, along whole length of shed.

The building is constructed of brick, with arched concrete roof. Smoke jacks are arranged at suitable distances.

Drop Pits

Drop pits for removing a pair of wheels is carried across two tracks. Ashdrop pits and hydrants for wetting ashes are situated outside shed. The shed can accommodate 20 locos and tenders, the heaviest engines being able to haul about 180 axles.

A "Whytes," single tank, double pump system, washout plant is in use, which permits boilers to be blown at 40-lbs pressure, and washed out and refilled with hot water, in about 4 to 6 hours.

Drop down pipes take off the blown off steam and water, through the main blow off line, into a filter, which, by a baffle, divides water and steam, the water passing to washout compartment of a tank, and the steam to refilling compartment.

Washing out water is then pumped, at about 90-lbs. pressure, through separate main and auxiliary pipes back to boiler, and washing out performed in a quick thorough way.

Refilling Process

Refilling is performed by pumping clean, hot, water from refilling compartment of tank back to boiler, this water being heated by steam, from blown off steam and water.

The pumps, running lightly, circulate hot, clean, water through separate pipes, connecting to washout and refilling lines, and so secures an instant supply of hot water, to delivery end of system. The temperature in the tanks is maintained at about 190 deg. F, by means of thermostat valves on steam heating pipes.

With this system, four boilers can be treated at once.

Duplex pumps are used for the washing out and refilling.

Washout plants, carrying out the same work, but of a less complicated type, have been designed and installed by Tongshan Works at some of the other loco. sheds.

The water supply of shed is carried from the works and is stored in an overhread tank of about 25,000 gallons capacity, near to shed.

The shed compresses its own air for use with hand tools, and an electric welding and oxyacetylene set is available for quick repairs. The end of the shed is used for repair work, and an overhead gantry of 1 ton capacity is arranged over two tracks, for lifting such parts as dome covers, cabs, feed water heaters, buffer beams, etc., when necessary.

Electrical Work

Electrical connections are arranged, so that drills, grinders, etc., may be used at any point in building, in addition to air tools.

Steam heating is available from radiators in and between pits, and shed is electrically lighted throughout. Electric welding and reinforcing is utilised to repair flats on tyres, worn hornblocks, boiler plates and flues, etc., all such welding being done in place.

Three vertical boilers supply steam for washout plant, shed heating, and air compressor.

A small machine shop, with power obtained from a steam engine, is situated at repair end of shed.

A 25 tons capacity, steam, break-down crane, is attached to the shed and can deal with derailments of the heaviest locos in service. It is fitted up with electric search light on jib and auxiliary portable lights. An oxyacetylene set is carried, for cutting wreckage apart when necessary.

Tongshan Works

The Locomotive and Carriage Works have been completely converted to electric drive and are fitted with motors to an aggregate of 1,600 horse power.

The Generating Station includes the following plant:

Two. 110 k.w., One. 220 k.w. and One. 500 k.w. direct driven steam set's Belliss and Morcom Engines, and Crompton Generators, Voltage 220, D.C. These are so arranged that either set can be run singly or all in parallel, thus giving a total of over 3,000 Amperes. For simplicity the two wire system has been adopted.

The Switchboard by Crompton consists of 20 panels, each feeder panel controlled by double pole circuit breakers.

The motors total 1,600 horse power, most of the machine tools are group driven, but there are many cases of individual drive.

There are 7 Electric Cranes with a lifting capacity of 10 to 45 tons. The lighting load aggregates 2,500 lamps of 20-1000 Watts. The work of the Electrical Department entails the maintenance of the Electrical Plant in Tongshan and all out stations. Train Lighting with a total of 195 coaches. Locomotive headlighting, 122 being equipped. Welding Plants of which there are three.

Telephones, a telephone exchange in the Works connecting all Departments, with a trunk line to The Kailan Mining Administration, capacity 150 lines, magneto call system being used.

Shortage in the Pigtail Crop

IF the American Silk Association can subsidize a Canton silk institute for the advancement of its own particular interests, why should not the American Cottonseed Oil Association spend a few millions in subsidizing the Northern Chinese to restore the pig-tail? We can almost guarantee that a few millions judiciously distributed will result in a crop of caudal appendages which will solve the difficulties of the cotton seed oil mills in America. The abandonment of the pig-tail by the Chinese and widespread revolutionary conditions of that country, have caused a famine of press cloth, a most necessary equipment of all cottonseed oil mills. The best quality of press cloth is made by weaving hair that comes from the heads of the Chinese. It even exceeds in quality that which is made of camel's hair, although the latter is used extensively for the purpose.

Camel's hair comes chiefly from Manchuria, and this industry also has been seriously affected by unsettled conditions in that part of China. The hair of the camels is not shorn, but it is gathered in the compounds where it has been shed by the animals. It is a meager and painstaking method of obtaining the material which is so highly prized for shawls and cloth-making purposes, but it affords a means of livelihood for many Chinese.

As yet no adequate substitute for Chinese human hair or camel's hair has been found for making press cloth, but experiments along this line are now being conducted. The hair from the tails of squirrels, which has often been substituted for camel's hair in the manufacture of paint brushes has been tried in the weaving and use of press cloth, but it is not found satisfactory in all respects, it is stated.

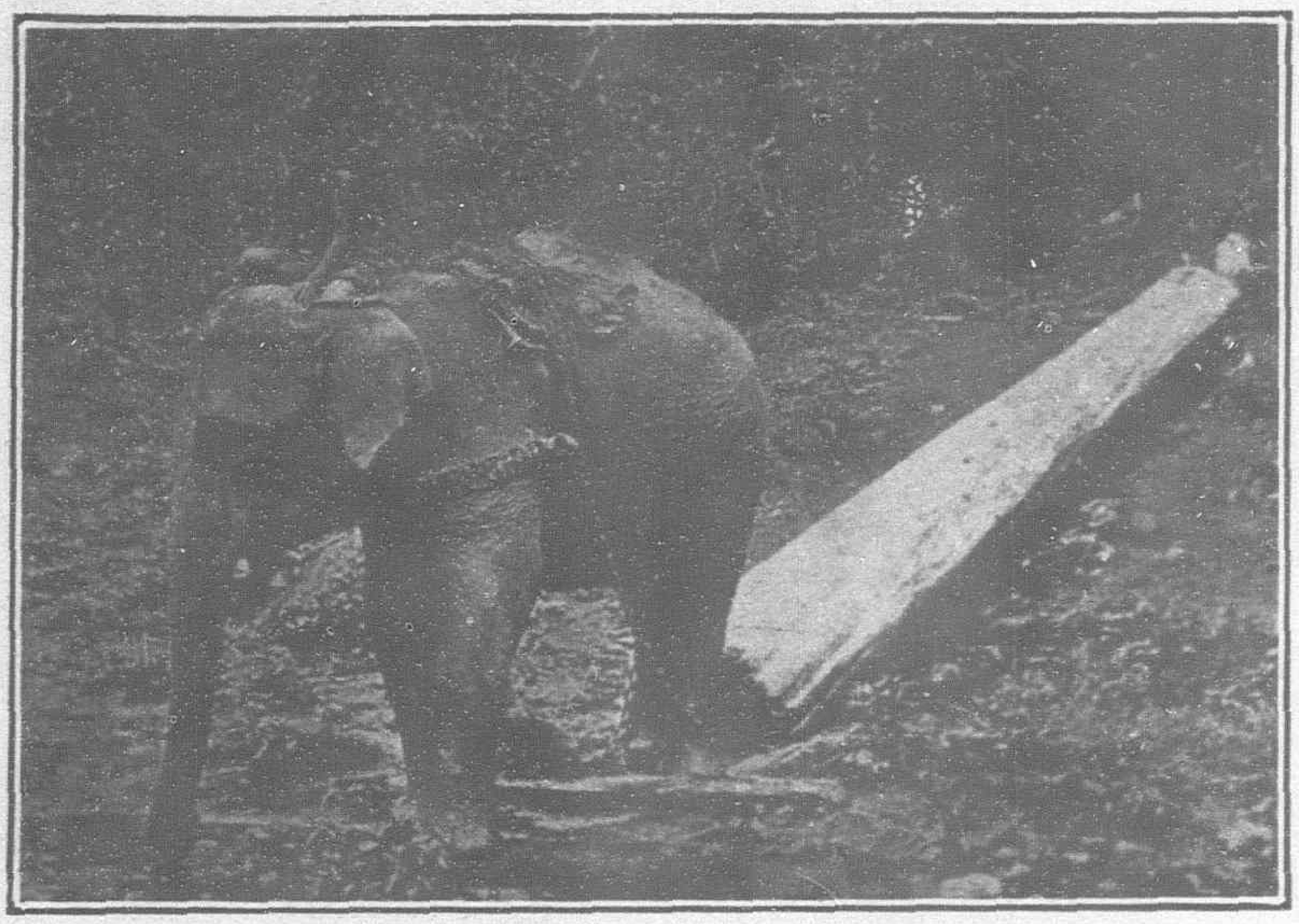
Another thing to be considered is that there is not enough squirrel tail hair available to meet the existing demands for press cloth by cottonseed oil mills.

The Chinese War Lords are overlooking a good bet. If Canton refuses to grow the pig-tail to save the American cottonseed oil industry, perhaps Chang Tso-lin might oblige.

Road-Building in Shantung.—According to the plan of the Highway Bureau of Shantung province, steps are being taken to construct motor roads (1) between Taierhchwang and Weihsien, (2) between Jihchao and Tsining, (3) between Tsangchow and Weihsien, (4) between Kiuhsien and Tsining, (5) between Litsing and Hotse and (6) between Taierhchwang and Tsining. The Litsing-Hotse road was already been completed and traffic opened. Preparations are now being made for the construction of the Taierhchwang-Weihsien road which will go through Ankiu, Chucheng, Luchow and Yihsien. Funds required for building this road are to be contributed by the districts *en route*.

The Coolie Built Garden of Malaya

By Kilmer O. Moe.

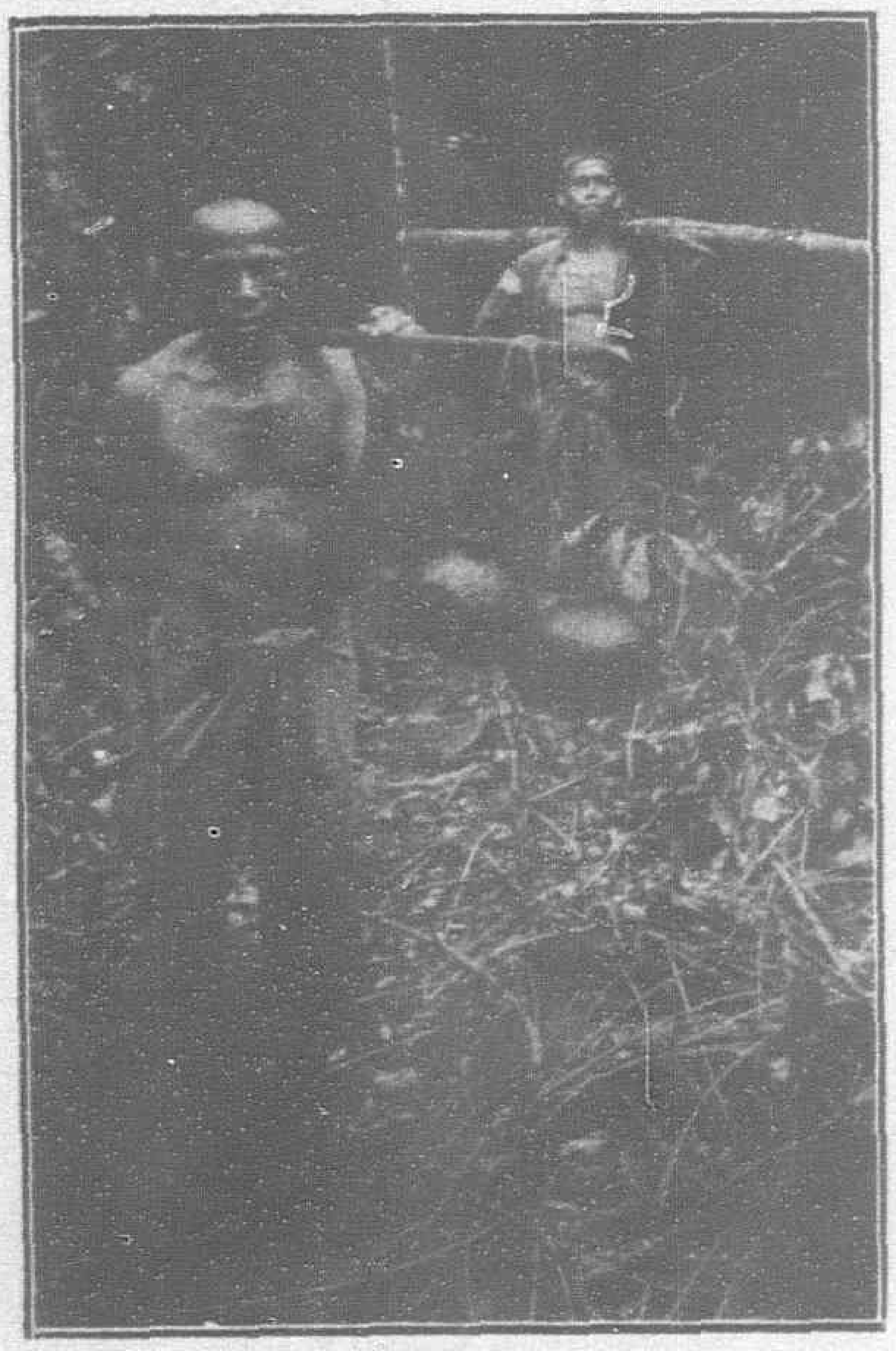


Fellow Workers in the Malaya

THE Malay Peninsula is one vast tropical garden, the product of the white man's brain directing yellow brawn. Excellent motor roads have been constructed to all points even in the uninhabited sections; an extensive state railway system crosses mountains and penetrates jungles to tie up the various states; Well constructed buildings adorn the towns and villages or crown the most prominent site on the coconut or rubber plantation; irrigation systems with reservoirs, mains and laterals, divert the waters from mountain streams to the *sawahs* of the native villagers; tin mines, the most extensive in the world, furnish nearly half of the world's supply; elaborate systems of bringing food and supplies to the toilers in mine and forest, and of transferring their proucts into the holds of ships—all these things are a result of coolie labor, chiefly Chinese who have come to this land of plenty in thousands and tens of thousands.

If every one had his rights there would be set up in the Federated Malay States a monument done in the most imperishable bronze or the purest marble in honor of the real builder of this wonderful country of gardens and roads and tropical abundance—The Chinese coolie, a yellow faced, snubnosed, muscular celestial, true son of the overcrowded empire of The Imperial Dragon.

We marvel at the progress made in the brief span of one generation. Vast fortunes have been extracted from mine and plantation. Huge revenues have accrued into the coffers of state which have been carefully expended under the supervision of the English. The power and the majesty and the glory of it all is reflected in the permanent improvements that meet the eye on every side. Nowhere else in a tropical country has there been greater material advancement in so short a period of time.

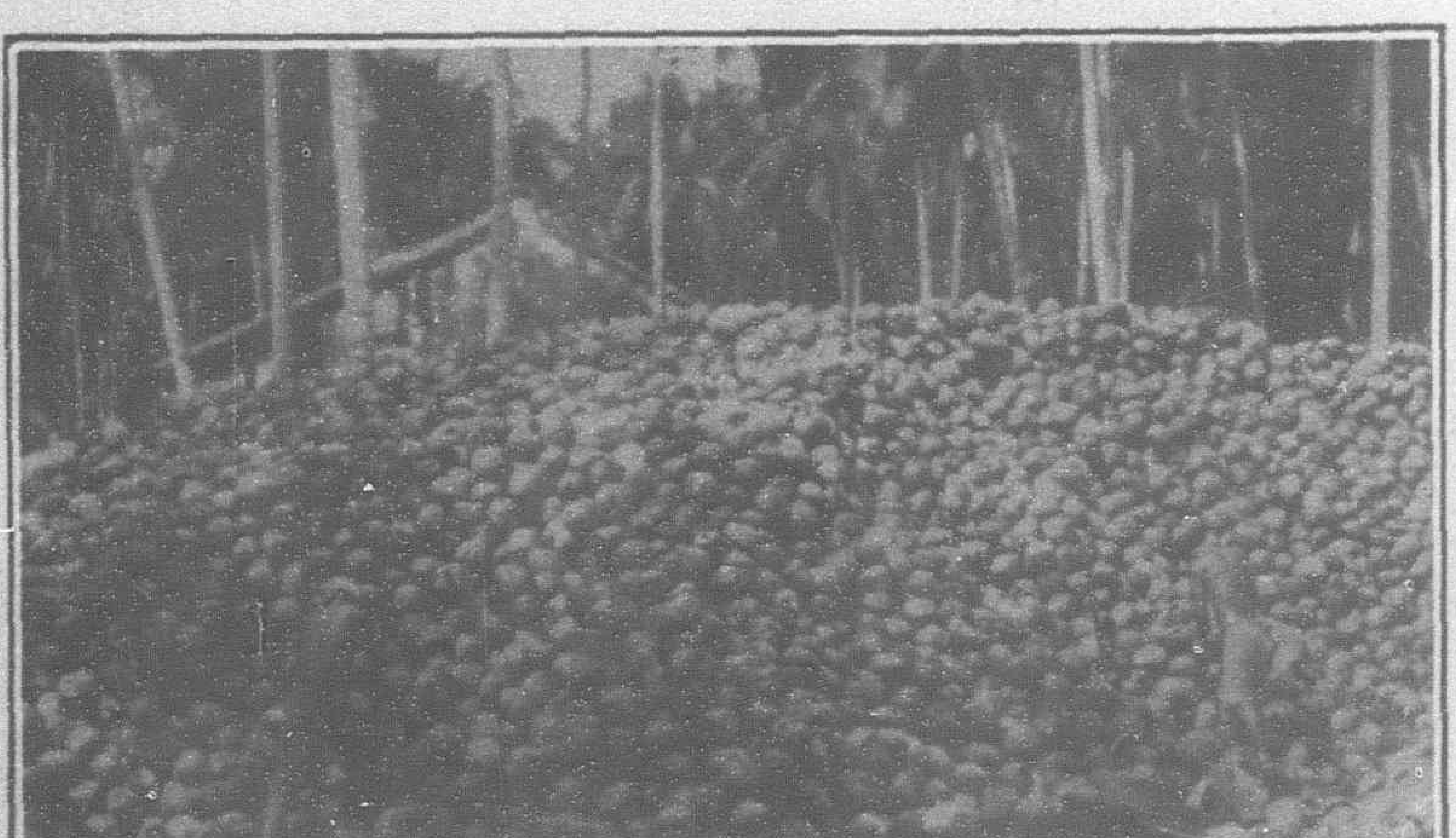


Sakai Carrying Water

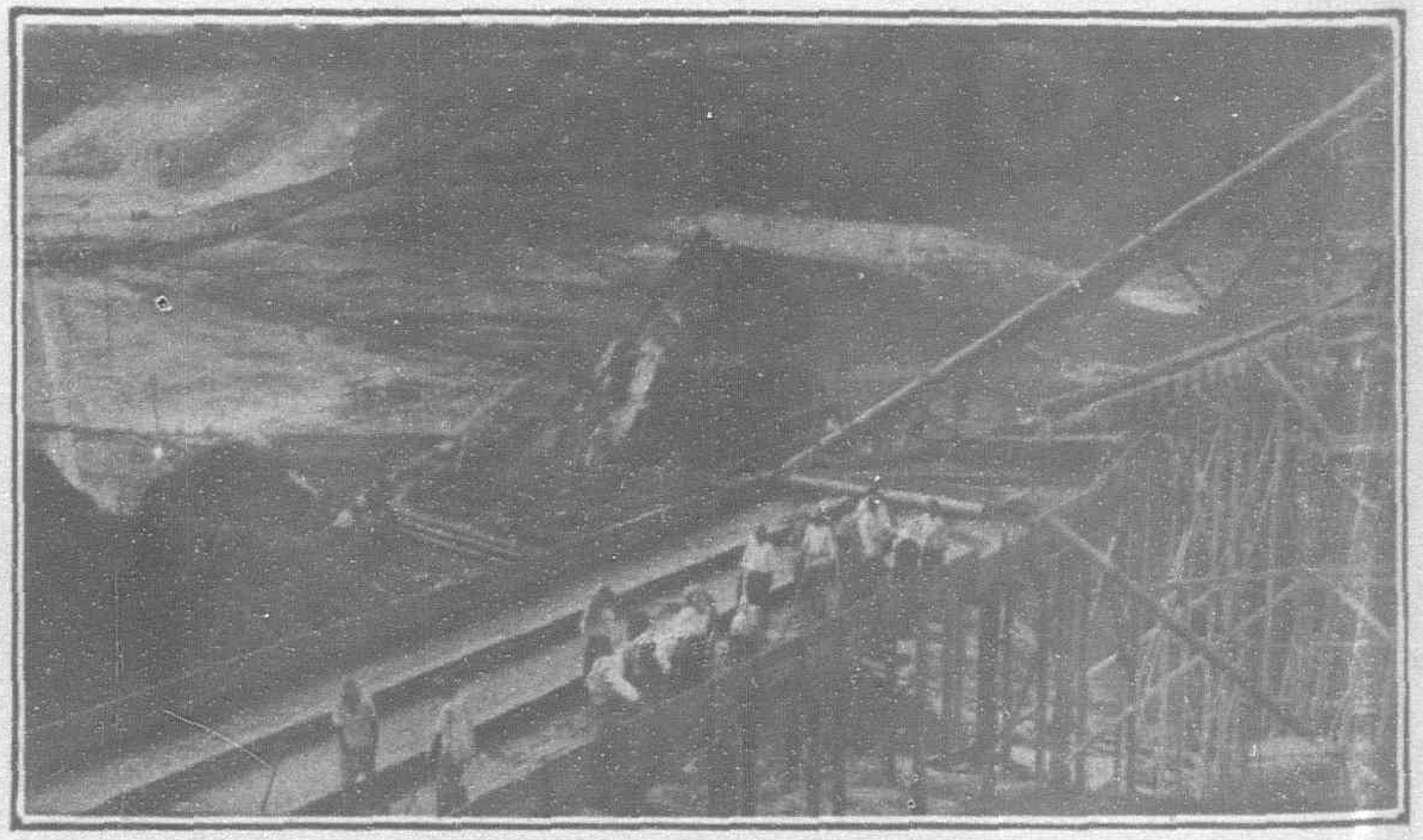
It is almost impossible for the passing traveller who speeds along the well kept roads in a high powered motor car, or who lolls on the cushioned seat of a railway train, which, by the way, is equipped with all the conveniences of this day and age, to realize that a generation ago this peninsula was one of the dark places of the earth, the land of the deadly *kris*, of pirates, and fierce tribal warfare. The wand of progress touched the squalor and the dirt, wrangling ceased, and presto, there sprang forth out of the jungle a white man's civilization equipped with cities and railroads, steam and electricity. Such is the magic of trade, the result of being able to supply the world with what it wants.

This Malaya was able to do in full measure. Two of the most widely used world commodities poured forth from the narrow confines of this narrow peninsula in such vast quantities as to practically establish a world monopoly for both. Nearly half of the supply of tin used by all nations has for a score of years come from the mines of Malaya. In this last decade the same may be said with regard to rubber which in 1918 reached 78,389 tons from the Federated Malay States alone with an export value of 13,584,665 pounds sterling. Tin the same year had an export value of 11,032,235 pounds sterling. There has been a decline since along with the slump in business the world over, but the country is still carrying on being one of the very few without a public debt.

It is the Chinese coolie that has made this progress possible. He it was who opened the mines, cleared the forest and tunnelled the mountains to let the trains pass through. He furnished the strength to lift the loads and carry the burdens. It was a slant eyed celestial who first opened the jungle trail which later was widened out into the first class motor roads on which we now are travelling.



Husking Coconuts

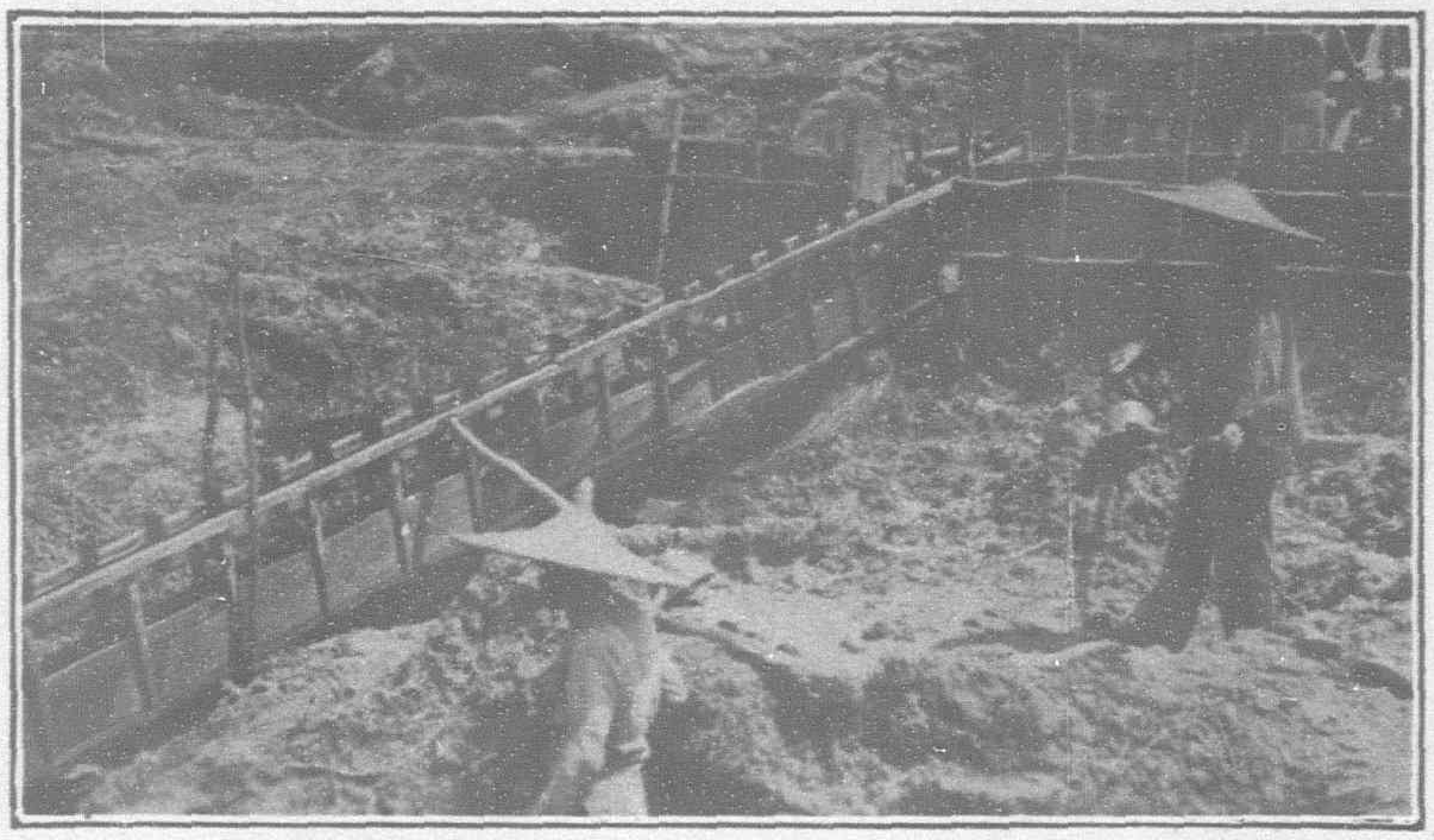


Washing Tin in Palongs

A Tamil Coolie in the Malaya

You see him in the tin mines delving among the rocks, or mucking down waist deep in sink holes to bring up the tin bearing ore. You see him bent under the weight of heavy loads which are swung from the two ends of a carrying stick. You see him deep in the jungle felling trees for the white man's rubber plantation. He plods along the jungle trail slimy with mud, dripping with a downpour of rain, or wet after crossing a swollen stream. He wears a pair of short breeches to hide his nakedness while the muscles are seen all a ripple up and down his brawny back. He invests his hard earned cash in a supply of goods which he carries to the furthest hills and exchanges then for forest products with the half wild Sakais. He is seen in the jungle at the end of a saw ripping planks from heavy logs to make flumes for the tin mines. Whenever there are loads to lift or burdens to carry there you may find John Chinaman taking the heavy end.

In this hot, moist climate the Chinese coolie is out of his natural element. Here within a degree of the equator the blazing sun beats down on him without mercy; the torrential rains close around him, but he has no spare hand for an umbrella; the heat weighs heavily on him but he cannot turn on the electric fan or the punkah. He accepts it all without a murmur of complaint. He is even cheerful, his yellow countenance breaking into a grin when you meet him on the road.



Chinese Coolies at Work in the Tin Mines

Of what we know as rational pleasure, to the coolie is a closed book. Sport is unknown to him; games he plays not at all. His vices are the coarsest, his self indulgence at times over-mastering. Opium and morphine dulls his intellect and brutalizes his character. Gambling is his great recreation. Living in a rabbit burrow of a barrack building in common with hundreds like himself, or quite alone in a hut out in the deep jungle, is quite the same to him. All he asks is an opportunity to hack, cut, delve, dig, lift and carry for the reward of a few paltry coppers, the greater portion of which he stows away for future use.

Why did he come to Malaya? This question to him would seem quite superfluous. Isn't this the eastern Eldorado where men grow rich? Coming as he does from his poverty stricken village in over-crowded China, the streets of Malaya seem paved with gold. Here he gets regular pay from the white overlords in a currency that does not depreciate and his wages are many times what he could have earned with the most gruelling work in his native land.

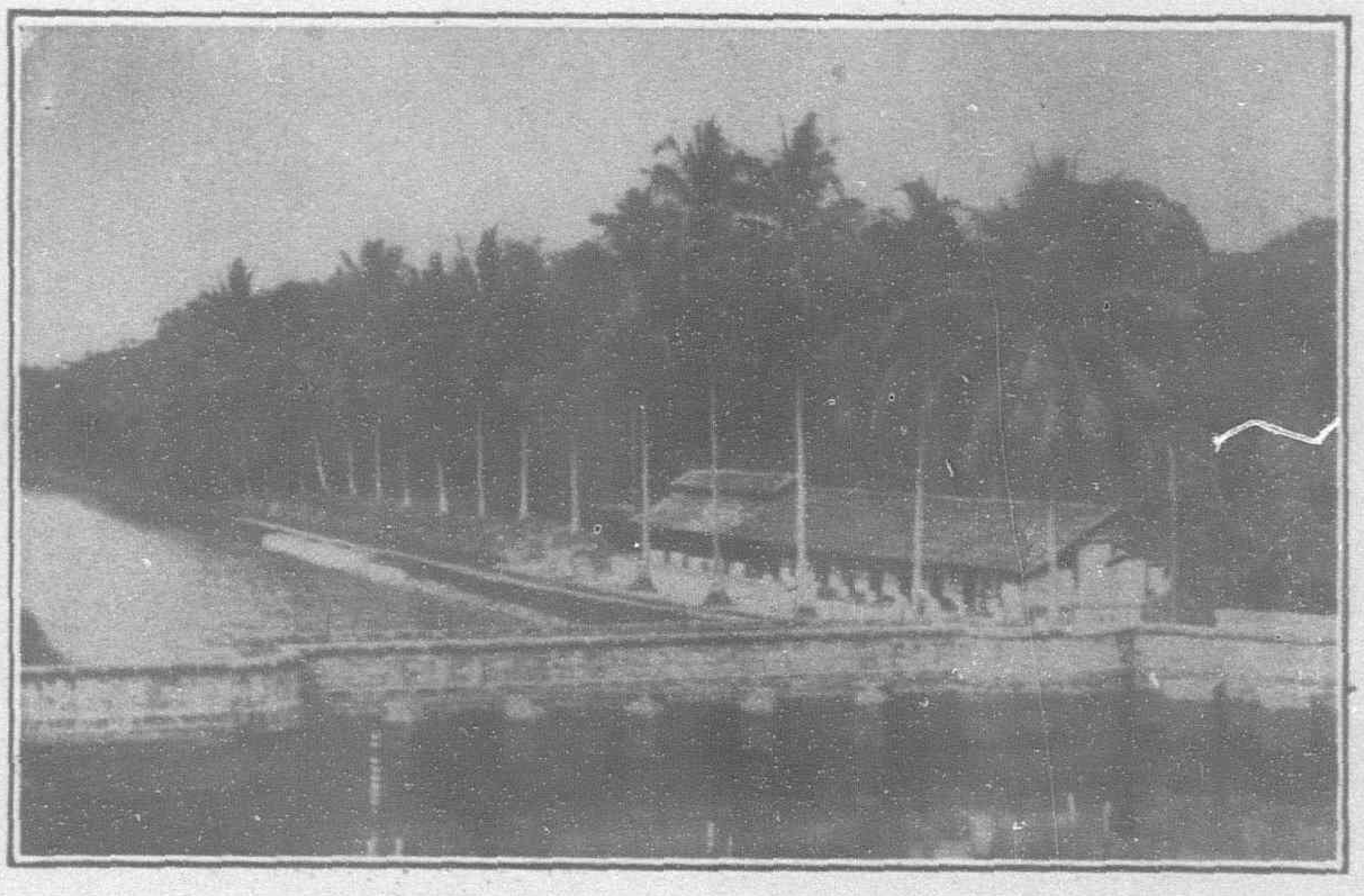
Such is the character of this human burden bearer, true specimen of spawning millions, the likes of which China may supply in overwhelming numbers without feeling the loss. This great reservoir of man power was tapped by the Malay peninsula to the extent of a million and a half, an element which now constitutes the most virile group of the population.

The coming of the *Orang Puteh* (white man) marked the change from the easy going days of the rule of the Rajahs under which the resources of the country were permitted to lie untouched from one century to another. And along with the white man's effort to enrich himself through the exploitation of the natural resources, came also his laws, his love of order, and his safeguards for the protection of life and property. All of these have superseded the law of the *kris* and the dagger, tribal warfare and cruel oppression. Life to-day in the interior of the peninsula is just as it is in the most civilized countries of the world.

There is no unrest in Malaya. The country is perfectly quiet and the people contented. The Malays and the Chinese live side by side in perfect harmony. Numerically they almost balance one another which is in itself an element of safety.

The good old days of Malayan romance of which so many have written seem to have passed forever. The condition of affairs when all men were pirates and all women were princesses have yielded to an era of peace and plenty under which the country is blossoming forth into a garden of unusual attractiveness. It is a matter of regret for some perhaps that another of the world's dark places is being lit up so rapidly, but to most people, and particularly to those who live there, it is a matter of profound satisfaction. We would not detract one whit from the glory of the early pioneers and empire builders who braved the dangers of man and beast in the forest jungle, in order that mankind might be enriched with products from mine and forest, field and plantation, but in distributing the honors let us not forget the humble toilers of the yellow race who gave of their strength in full measure that the white man's hopes might be realized and his wildest dreams come true.

Irrigation Canal for Rice Cultivation



Head Sluices, Krian Irrigation Reserve

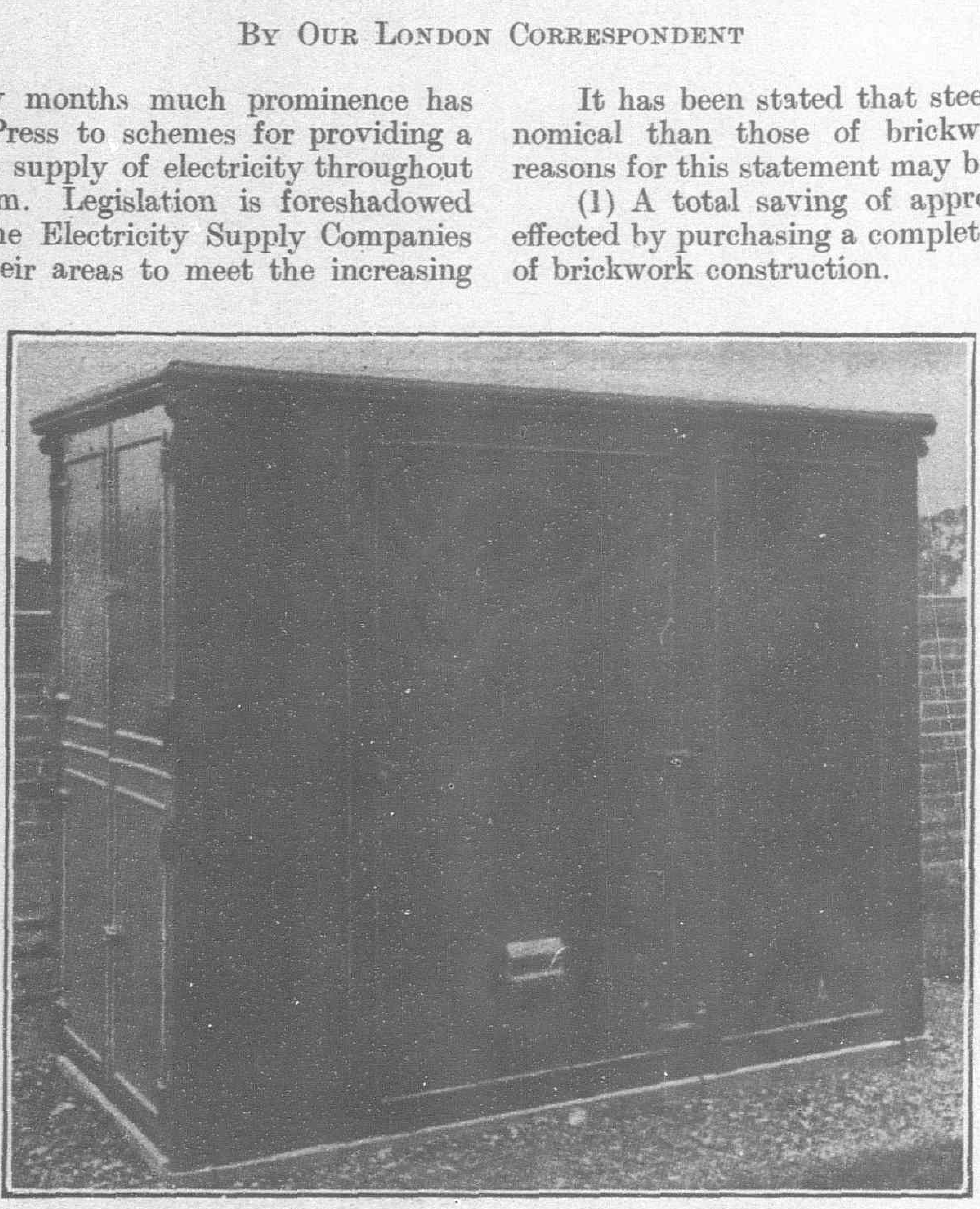
Recent Transformer Sub-Station Developments

By Our London Correspondent

DURING the last few months much prominence has been given in the Press to schemes for providing a cheap and abundant supply of electricity throughout the United Kingdom. Legislation is foreshadowed which will enable the Electricity Supply Companies to extend rapidly their areas to meet the increasing demand for electric light and power.

At the present moment numerous extensions are taking place, but these represent only a small proportion of the facilities required by consumers of electricity. The Supply Companies in their desire to meet their clients' requirements are faced with many erious difficulties, the principal of these being the high capital cost of enlarging their networks.

One of the most important items of capital cost is that of thes ub-stations, in which the high tension supply is transformed to low tension for local requirements. Until quite recently sub-stations were constructed almost entirely of brickwork, but in fairly remote and inaccessible districts the high cost of obtaining labour and transporting the material made this type of construction uneconomical.



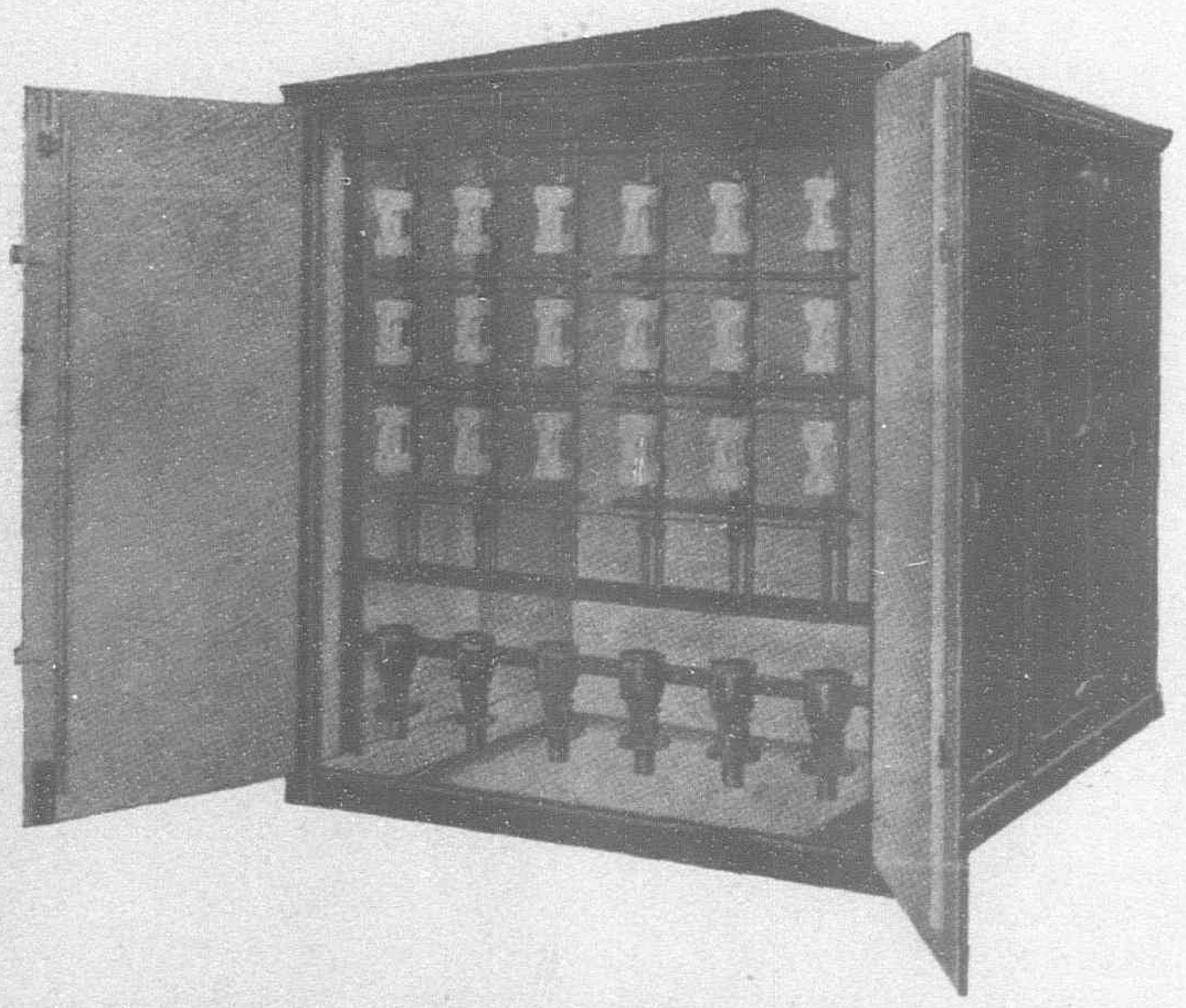
Kiosk Sub-station G.E.C. Transformer. Exterior View

Steel plate Kiosk sub-stations have been introduced to overcome the difficulty of high expenditure, and among the first to manufacture these sub-stations was the General Electric Co., Ltd., of Magnet House, Kingsway, London, England, the complete equipment being manufactured at their Switchgear Works, Witton, Birmingham.

G.E.C. Kiosk sub-stations have been supplied to a number of Supply Authorities including the Leicester Corporation, Belfast Corporation, Birmingham Corporation, Keighley Corporation, Kingston-on-Thames U.D.C., Preesall U.D.C., and Thornton Gate U.D.C. They are in accordance with the usual high standard of G.E.C. manufacture, and contain a number of outstanding features which ensures their efficient working in the most exposed positions.

Before mentioning the unique merits of G.E.C. Kiosk sub-stations, a few remarks will be made on steel plate Kiosk sub-stations in general.

The equipment of these sub-stations consists of high tension switchgear, transformers and low tension switchgear, the maximum capacity being 200 KVA for voltages not exceeding 11,000 Volts.



Kiosk Sub-station G.E.C. Transformer. Low Tension Side, Interior View

It has been stated that steel plate sub-stations are more economical than those of brickwork construction. The principal reasons for this statement may briefly be summarised as follows :—

(1) A total saving of approximately 35% in capital cost is effected by purchasing a complete Kiosk sub-station instead of one of brickwork construction.

(2) A reduction in superficial area. A kiosk requires only half the space needed for a brickwork sub-station of similar output.

(3) A concrete slab is the only foundation required.

Owing to the reduction in cost, it is possible to instal a larger number of sub-stations. This enables further economics to be effected, as high tension cables with smaller section of copper conductors can be laid to a larger number of points, and replace the heavier cables required by low tension transmission lines.

Another important advantage of the steel plate Kiosk sub-station is that it can be installed in a new area, where development is anticipated, but the ultimate load doubtful. It is only necessary to run a high tension cable to a single point in the middle of the area. If the scheme developes a larger sub-station can easily replace the one erected, the latter being then available for transportation to another area. Thus the capital expenditure for installing a supply in a district of this description is reduced to a minimum.

The G.E.C. Transformer Kiosk sub-station, an exterior view of which is shown in Fig. 1. is constructed of heavy gauge steel plate with welded steel roof. Cast iron mouldings and cornice pieces are provided, while the design of the sub-station ensures the structure being absolutely weather proof.

These sub-stations are divided into three compartments, the step-down transformers being accommodated in the middle section with the high and low tension switchgear on either side. Steel plate doors are provided for each section.

As regards the equipment the high tension side (Fig 2) consists of an oil circuit breaker with overload and leakage trip coils, and current transformers for use with the latter. The oil circuit breaker is isolated from the supply by means of isolating links.

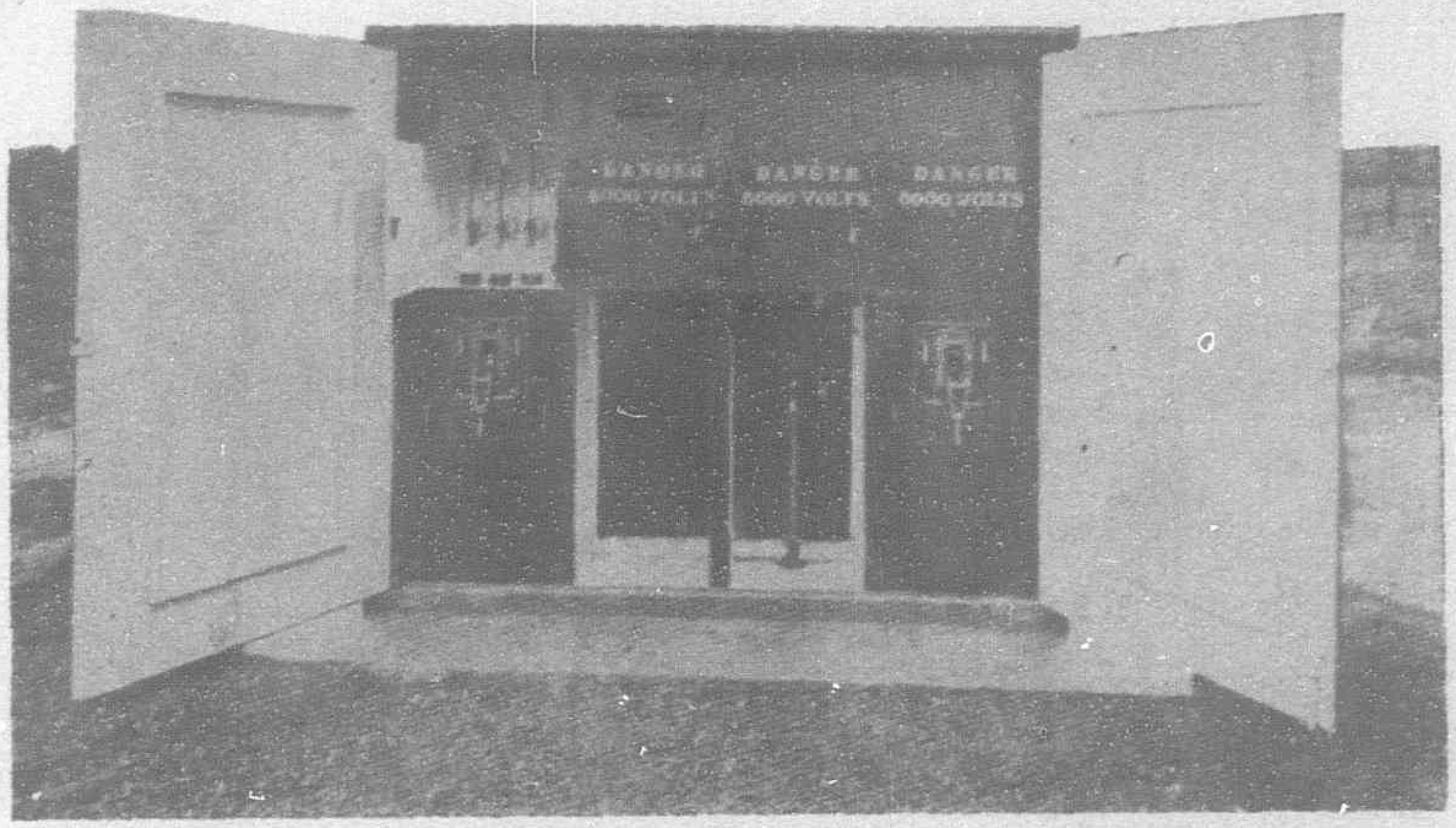
On the low tension side (Fig. 3) the distribution circuits consist of G.E.C. Unit type "Handguard" fuses mounted on bakelite tubes, while ammeters and voltmeter can be supplied if required. Cable Boxes with efficient sealing devices are provided for use with all cables.

In G.E.C. Kiosk sub-stations other interesting features are noticeable. To take an important example, the high tension switchgear and connections are enclosed by double doors. Thus when the outer doors are opened to operate the circuit breakers, *no "live" metal is exposed.* The inner doors enclosing the isolating links are fitted with padlocks, to prevent tampering by unauthorised persons. In Fig. 2. one of these doors is open to show the interior.

Another feature of G.E.C. Kiosk sub-stations is that the low tension switchgear is mounted on bakelised metal tubes and *not* on slate slabs (see Fig. 3.) Bakelised metal tubes provide more efficient insulation and are an infinitely better proposition for this class of apparatus.

The equipment of these sub-stations is mounted well inside the Kiosk and it is not possible for rain to drip on any portion of the apparatus when the doors are opened. At the same time both the switchgear and transformer are readily accessible for adjustment or other purposes.

These sub-stations are well ventilated and are quite vermin proof. They may be installed at the end of outgoing feeders or on a ring main system.

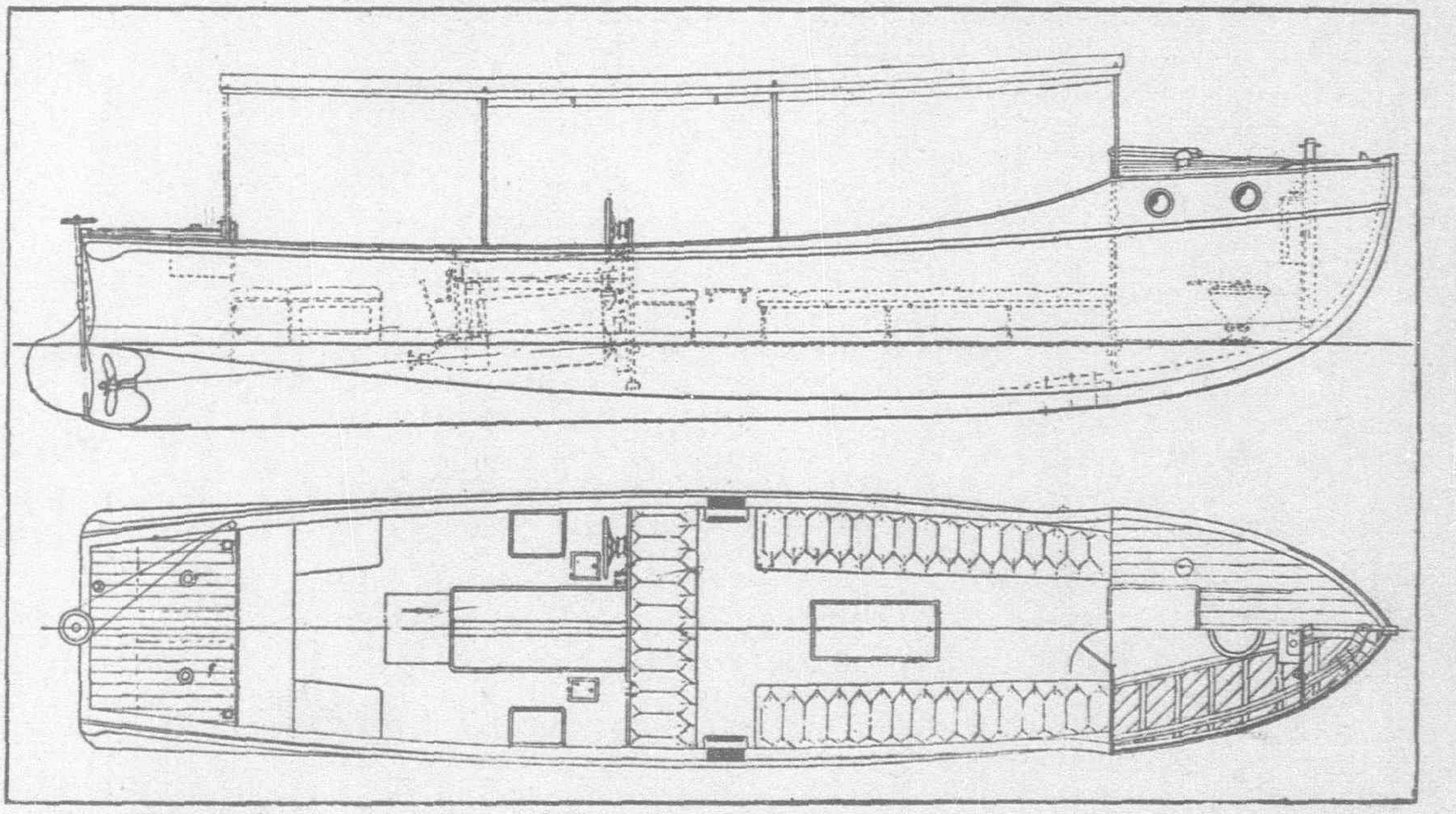


Kiosk Sub-station G.E.C. Transformer. High Tension Side Door of Isolating Switch Chamber Open to Show Interior

G.E.C. Kiosk sub-stations are shipped complete, and can be in service a few days after delivery on site.

A Fast Motor Launch for Sumatra

UPON the occasion of a recent visit to the Walton-on-Thames Launch Co. we observed a fast launch, which has been specially designed for use on a quick-running river in Sumatra. Designed by Mr. Burnard, this boat has an overall length of 30-ft., with a beam of 6-ft. 4-ins, and a maximum draught of 2-ft. The hull, which is now almost completed, has nice lines; speed is the foremost requirement, and liberal flare is provided, which should make for a dry boat, and, moreover, one capable of withstanding moderately heavy weather. The current to be contended with is one which at times attains a speed of as much as 8 knots. The trials of the boat will be of special interest from that point of view, and an excellent turn of speed is anticipated, particularly as the machinery consists of one of the new 70 h.p. six-cylinder Ailsa Craig motors driving a three-bladed propeller direct.


From *Motor Boat*

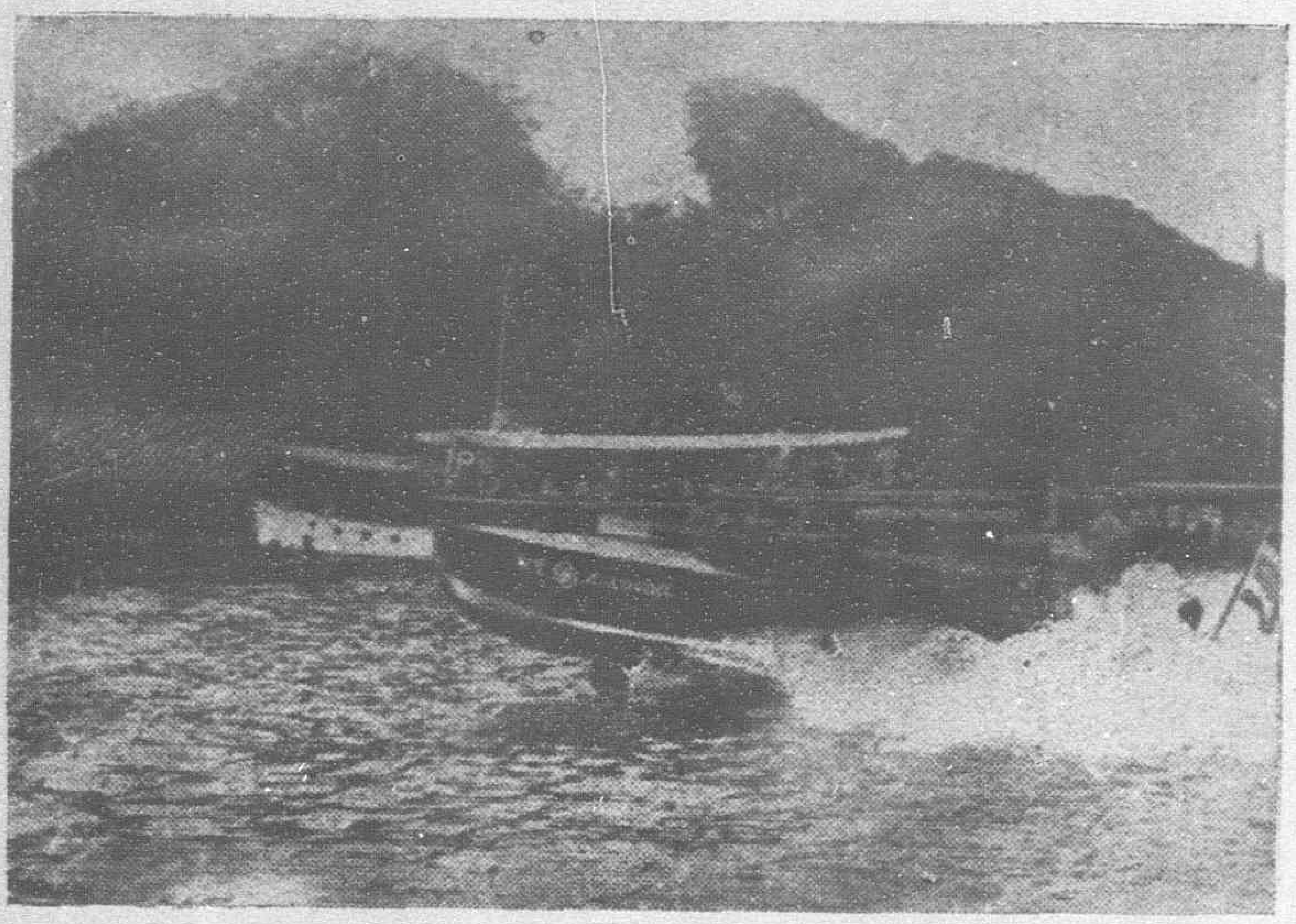
An Unusual Craft for Overseas Use

Before describing the arrangements of the boat it may be of interest to refer briefly to the specification. The hull is of moderately heavy construction; the keel is of American rock elm, the hog, gunwales, timbers and rubbers being of the same material. The timbers are steamed and run in one length from gunwale to gunwale. The stem is of natural grown oak, together with the knees. The teak planking is of the double-skin variety, the inner skin being laid at an angle of 45 degrees to the outer planking, which is laid fore and aft; waterproof fabric is interposed between the two skins.

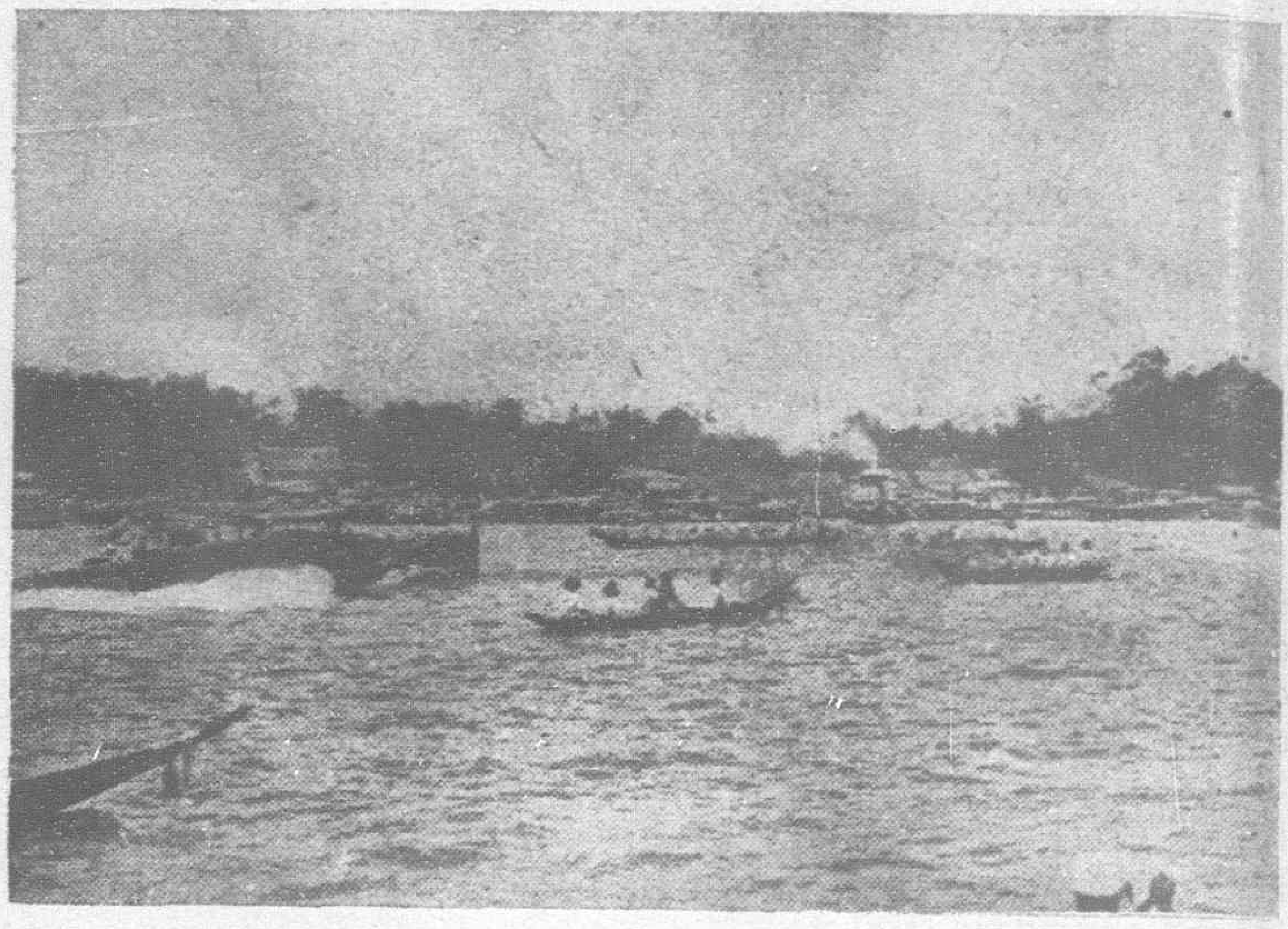
Fuel will be carried in two tanks, each furnished with an independent pipe line to the carburetter, whilst the water-circulating system will be provided with two inlets and dual strainers, each with an independent set of pipes leading to the water-circulating pump. A comprehensive set of spares is to be carried, including additional propellers, a standby starting battery and other items of equipment; the motor is fitted with electrical starting gear in addition to the hand-starting arrangements.

The boat is entirely open apart from a small cabin forward, which comprises a lavatory. This space is followed by a large open cockpit, having seats at each side and against the bulkhead at the after-end. This bulkhead is slightly aft of amidships, and upon it on the after side is mounted the steering wheel. Aft of the cockpit is the machinery space, with additional seating accommodation right aft. A permanent wooden awning is provided over the accommodation, and side curtains will be fitted, an indication of these arrangements being given in the plans.

The interior fittings are mainly of varnished teak. The boat will be finished in white enamel, the underwater parts being coated with green anti-fouling paint. In view of possible damage to the propeller, protection is afforded by means of the deadwood which runs right aft, together with a skeg, an extension of which forms the lower support of the rudder.



A 200 h.p. Hydroplane Passing the King of Siam's Pavilion at Bangkok.



A Fast Displacement Boat with a 150 h.p. Engine

Motor Boat Progresses In Siam

All Varieties of Craft from Fast Hydroplanes to Big Passenger Vessels

ALMOST from the day when the first motor was installed in a boat, Siam has watched the progress of the motor boat with the greatest interest, with the very practical desire to utilize this means of transport to the maximum extent. For in Siam there are many rivers and canals, and, moreover, the inhabitants are fond of the water and are used to its navigation.

In one of the first few numbers of *The Motor Boat* an illustration was published of a boat in use at Bangkok fitted with a Daimler motor, with hot-tube ignition and hit-and-miss control. This was more than 20 years ago, and it says much for marine motor design, even in those early days, that the engine is still running, but now has a vaporizer for paraffin fuel, and is fitted with magneto ignition, whilst a throttle valve takes the place of the hit-and-miss control.

All the waterways in Siam that are deep enough have a service of motor passenger boats. The larger craft running on the rivers take from 100 to 200 passengers, and are usually equipped with semi-Diesel motors. The smaller boats operate on paraffin. Many of the Government Departments, such as the Army, the Navy, the Posts and Telegraphs, Irrigation, Inland Revenue, Public Health and Police, have a large fleet of motor boats.

All the rice mills, sawmills and business houses that are on rivers or canals own motor boats, and there is a very large number of private owners who may roughly be divided into four classes. Those of moderate means use outboard motors or two-stroke inboard motors of about 3 h.p. Others a little better off employ petrol-paraffin motors from 10 h.p. to 20 h.p. for runabouts in the city and for week-end cruises. Next, there is the owner of the moderate-sized cruiser, about 30-ft. to 60-ft. long, and this class may be divided into sea-going and river cruisers. Finally, there are the speed enthusiasts who have Vee-bottomed boats and hydroplanes. The modernity of the marine motorist in Siam may be gauged from the fact that a hydroplane in now being built at Bangkok in which a 500 h.p. Liberty engine is to be installed.

Many of the Buddhist temples are on rivers or canals, and in several instances the community provides the priests with motor boats so that they can proceed to ceremonies, funerals, weddings, etc., in comfort and conveniently. Some interesting novelties are sometimes to be seen, as for instance, the stern tube in the boat belonging to a priest whose temple is on the banks of a very sandy river. This stern tube is made of water-buffalo horn, and it is stated to last very much better in sandy water than those of metal construction.

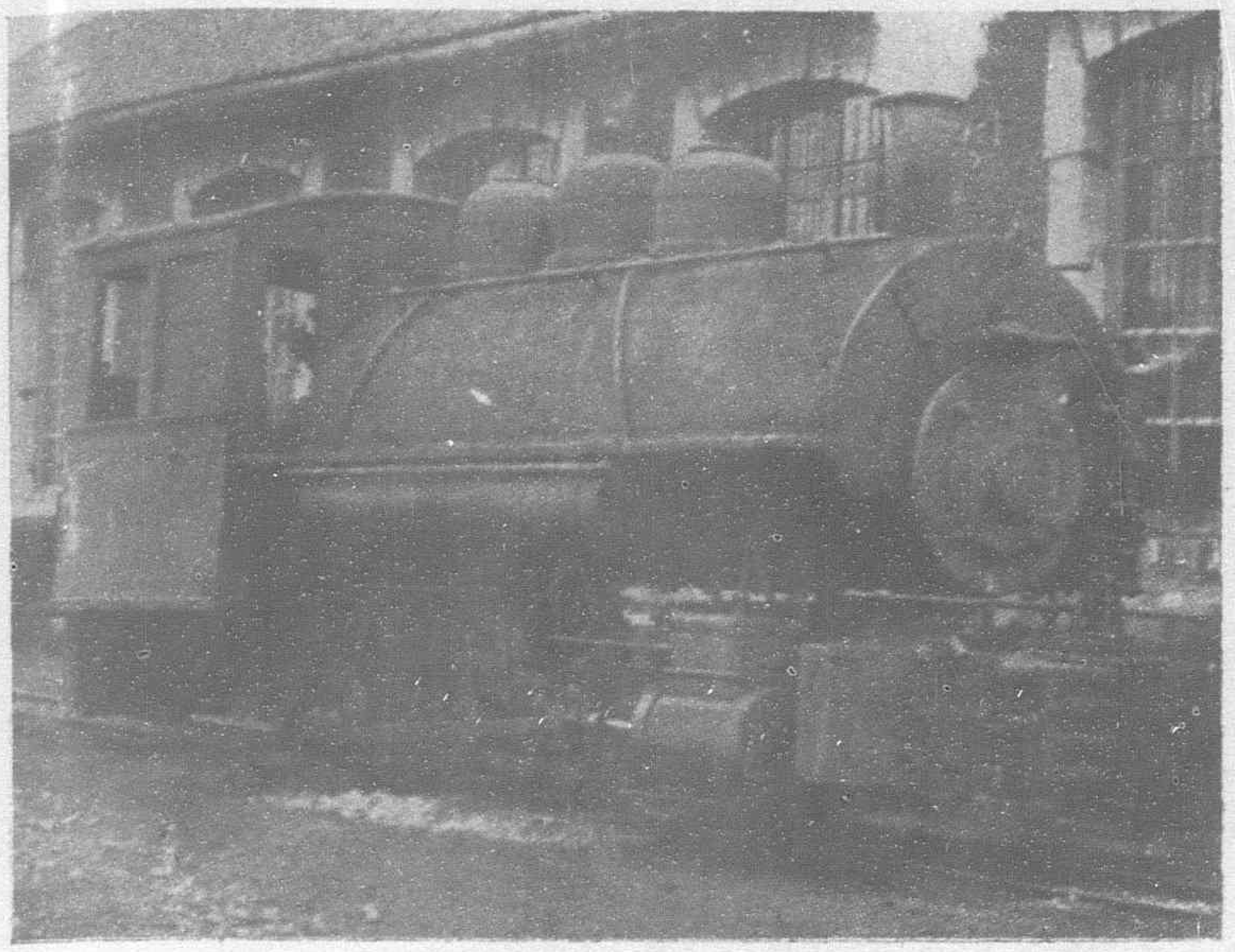
Motor-boat regattas are frequently held at Bangkok, and on those occasions enormous numbers of people are present in boats of all sorts, as well as on the river banks. The illustrations give an idea of the enthusiasm which is aroused at these events, and it will also be seen that the committee are able to possess themselves of very attractive craft for the races.

Lumber Kings Fight for Pacific Steamship Supremacy

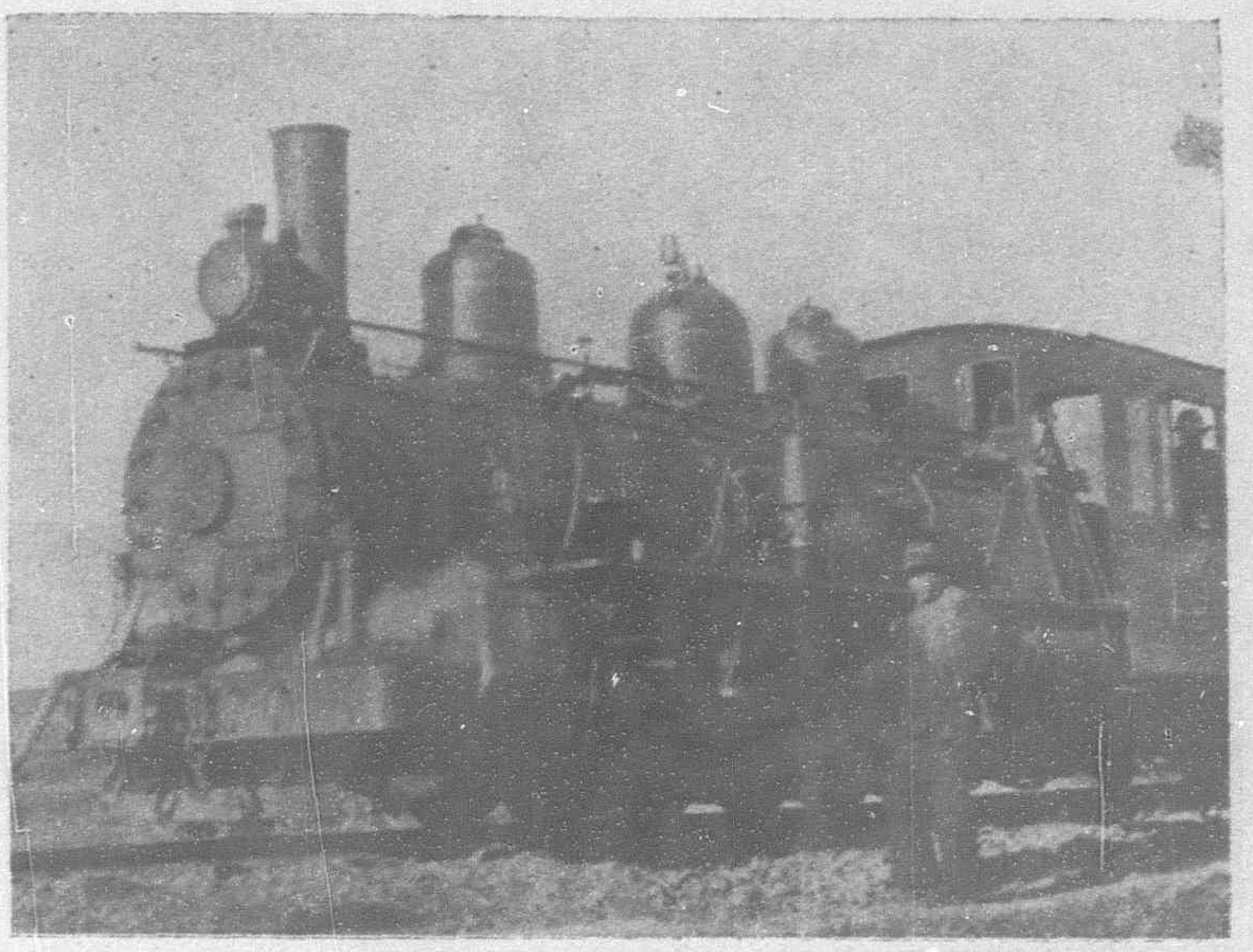
FOLLOWING closely on the heels of the announcement that direct Shipping Board services from San Francisco and Los Angeles to North China and Japan are to be restored by the American-Australian-Orient Line under the management of Swayne & Hoyt of San Francisco, comes the announcement that a $30,000,000 California shipping concern is about to materialize under the nucleus of tremendous expansion of the Charles Nelson Company, financially backed by A. B. Hammond, a Pacific Coast lumber king. The California Shipping Company organized six months ago by the Nelson interests under the laws of New Jersey, is to become operative in the near future.

This company, will, it is reported, purchase all the remaining Shipping Board freight lines operating in the Pacific, including the 17 Shipping Board freighters now operated by Swayne & Hoyt in the Pacific Coast, Australian and Oriental trade. This company recently organized the American-Australian-Orient Line by combining the American Far East Line and the Pacific Australia Line, the Japan and North China business being allocated to the Oregon Oriental Line, operated out of Portland by the Columbia Pacific Shipping Company, thus eliminating the service to these ports previously maintained by the America Far East Line. The Swayne & Hoyt services include Shanghai, South China, the Philippines, Indo-China and Siam ; the other to Yokohama, Kobe and North China ports.

The new Nelson combine will take over the Swayne & Hoyt services. The Nelson Company has already bought seven government steamers of the " Bridge " and " Lake " types. Four of these ships are now on the Pacific reconditioned for coastwise and intercostal lumber trade. The consummation of this deal will divide the Pacific freight business between the two great Pacific Coast Lumber Kings, Dollar and Nelson.



Davenport 0-6-0 Locomotive Waiting to Take Out a Train



0-10-0 Locomotive, Road No. 22 on Test

The Yunnan-Kopei Railway

By E. P. Williams, Jr., of the Baldwin Locomotive Company

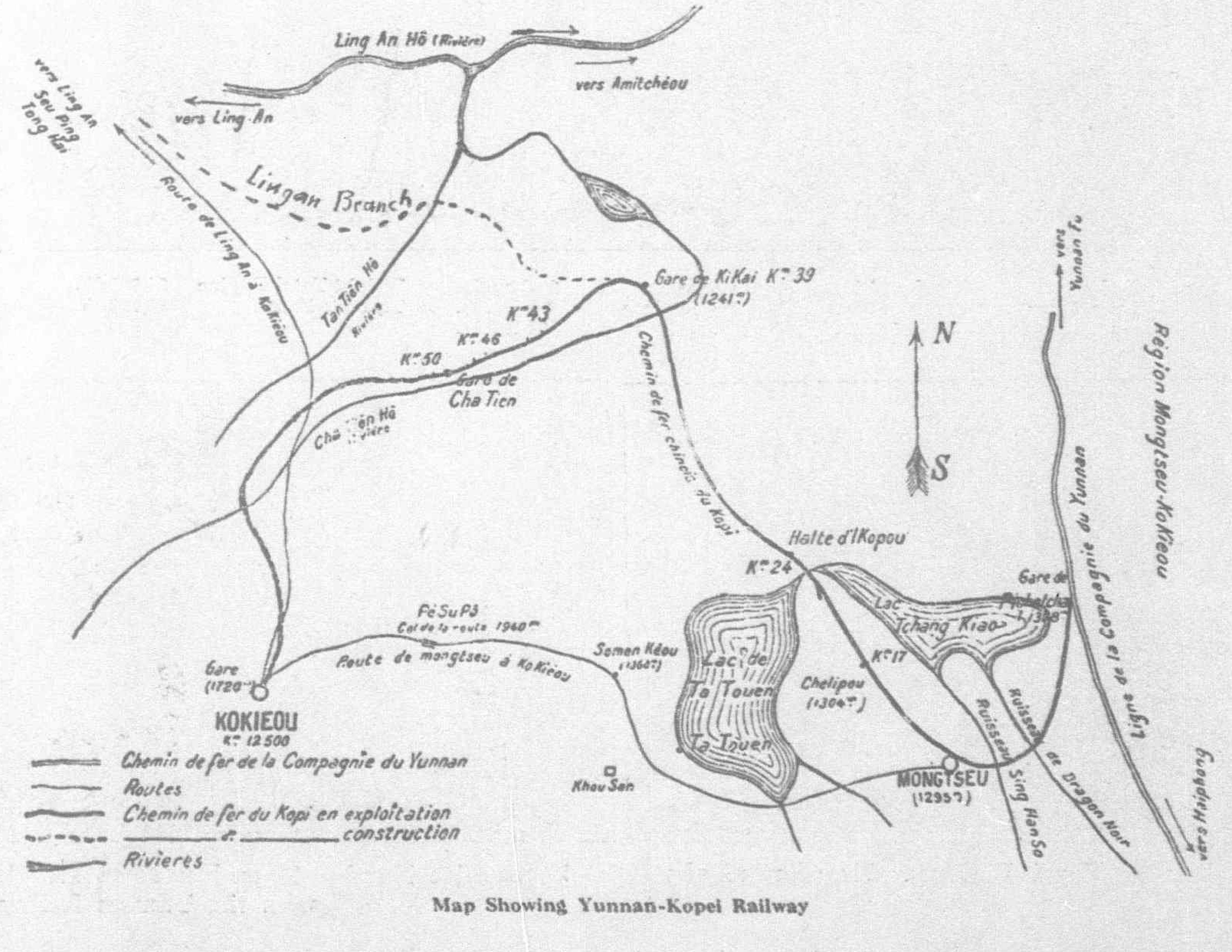
THE tin mines of Kokiu—situated in the southern central part of Yunnan, the southernmost province of China, and at an altitude of 5,640 feet—have been in operation for many hundreds of years, and until comparatively recently the shareholders have been content to transport the tin on bullock carts and pack horses. However, when the plans for building the French Railway Chemin de Fer de la Compagnie du Yunnan, between Haiphong, Tonkin and Yunnanfu were actually commenced, the idea of a light railway between Kokiu and Peichetchai, on the French Railway, was seriously considered.

A preliminary survey was made and estimates prepared, but it was not until 1915, when the price of tin started to rise to what was then unprecedented heights, that the construction was actually started under the leadership of Mr. Chen Ho-Ting, the present President of the Railway. The first seven miles between Peichetchai and Mengtse, one of the few treaty ports of Yunnan, were opened to traffic in 1917, and the line to Kokiu, a total length of 45 miles, was completed in 1921.

The construction and operation of the Railway, which is of 23 5/8-inch gauge, laid with 33-pound rails, is exceedingly difficult due to the severe service conditions. These include 3 per cent. grades, 230 feet reverse curves, and limits of height and width of 12 feet 11 inches and 8 feet 10 inches respectively.

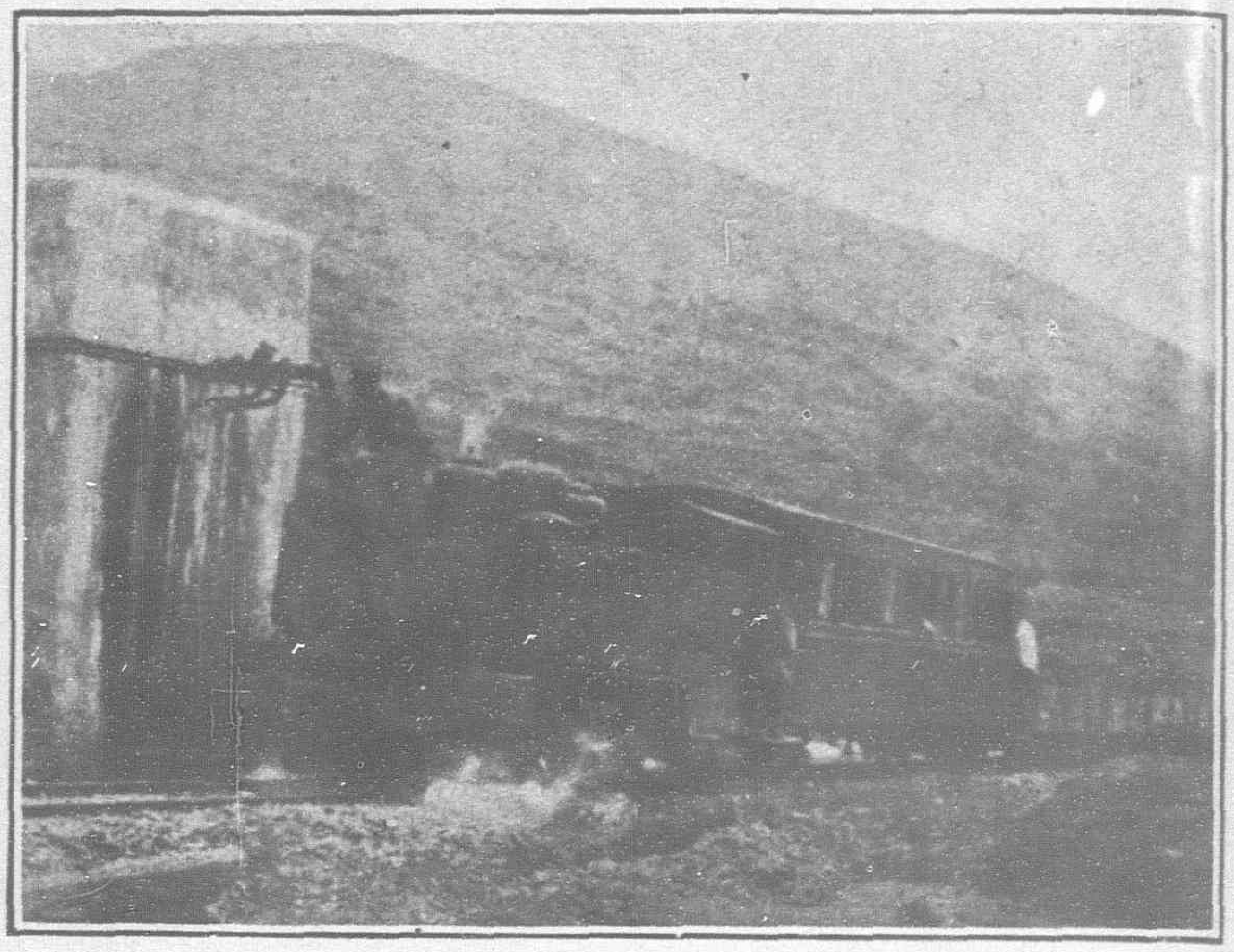
From Peichetchai, which is about 4,500 feet above sea level, the railway descends into the plain of Mengtse, over 3 miles of 2.5 per cent. grade combined with 328 feet curves. It then runs over a right of way where there are numerous short grades of 2.2 per cent. and 2.8 per cent until mile 20 is reached, where there are 3 miles of 3 per cent grade and 394 feet curves. From Kikay, the halfway point and where the new line to Lingan will branch off, the road starts to climb. Until mill 41 is reached there are hardly 164 feet of straight track and the grades are continuous, varying between 2 per cent and 3 per cent with curves of 230 feet and 262 feet radius. In passing this section the road runs through 8 tunnels, the longest of which is just over 2,296 feet. Five of these tunnels are located on reverse curves, and tunnel No. 8 makes a complete half circle around a 295 feet curve over a 2.5 per cent grade. After passing mile 41 the line descends to Kokiu, there being only one tunnel and no exceptional grades or curves on this part of the line.

In order to make an outlet for and open up a large agriculturally rich district, the Kopei Railway in 1921 began the construction of a line branching off at Kikay. This line will extend to Lingan, a large city on the old caravan road to Yunnanfu, noted for its potteries, and 40 miles away. The building of this branch line is under the direction of Mr. K. C. Li, and, although the work is difficult and has been much delayed by bandits, it is expected that it will be opened for traffic next year. The Kopei Railway,



Map Showing Yunnan-Kopei Railway

A Troop Train of 13 Cars Hauled by a Baldwin 0-10-0 Locomotive

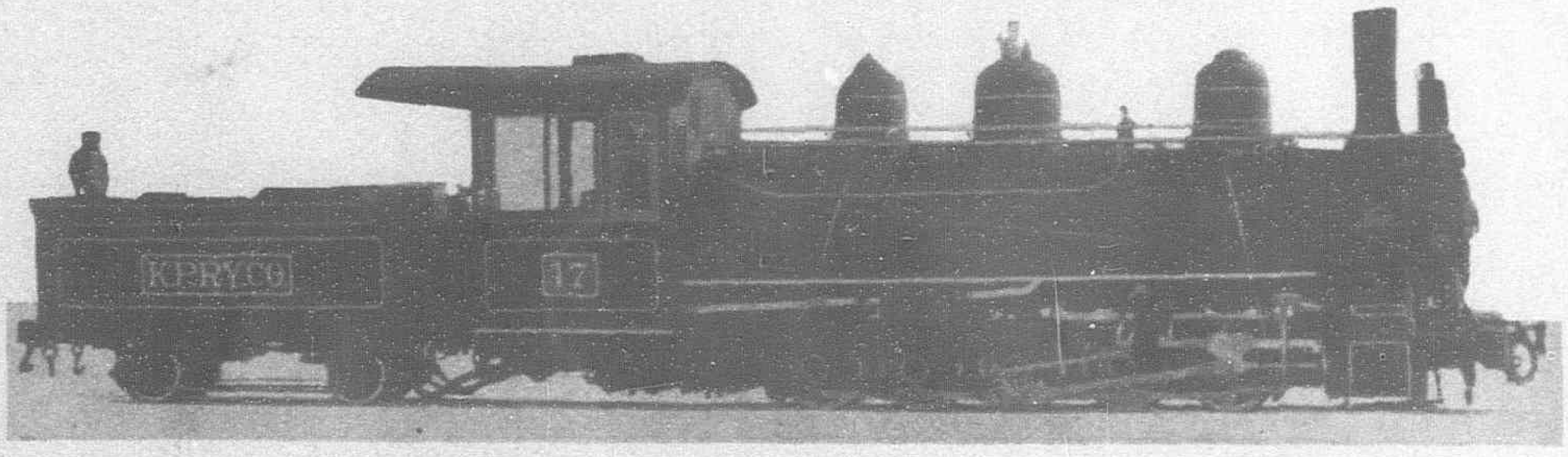


0-8-0 Type Locomotive on a Test Run

which is intimately connected with the Yunnan Tin Company whose smelter is at Kokiu, is entirely Chinese owned and at the present time has for its President Mr. Chen Ho Ting; Vice-President, Mr. Chao Pei Chai; Traffic Manager, Mr. Chu Yu An, with Mr. K. C. Li, a Chinese engineer and Cornell graduate, in charge of the construction of the Lingan branch.

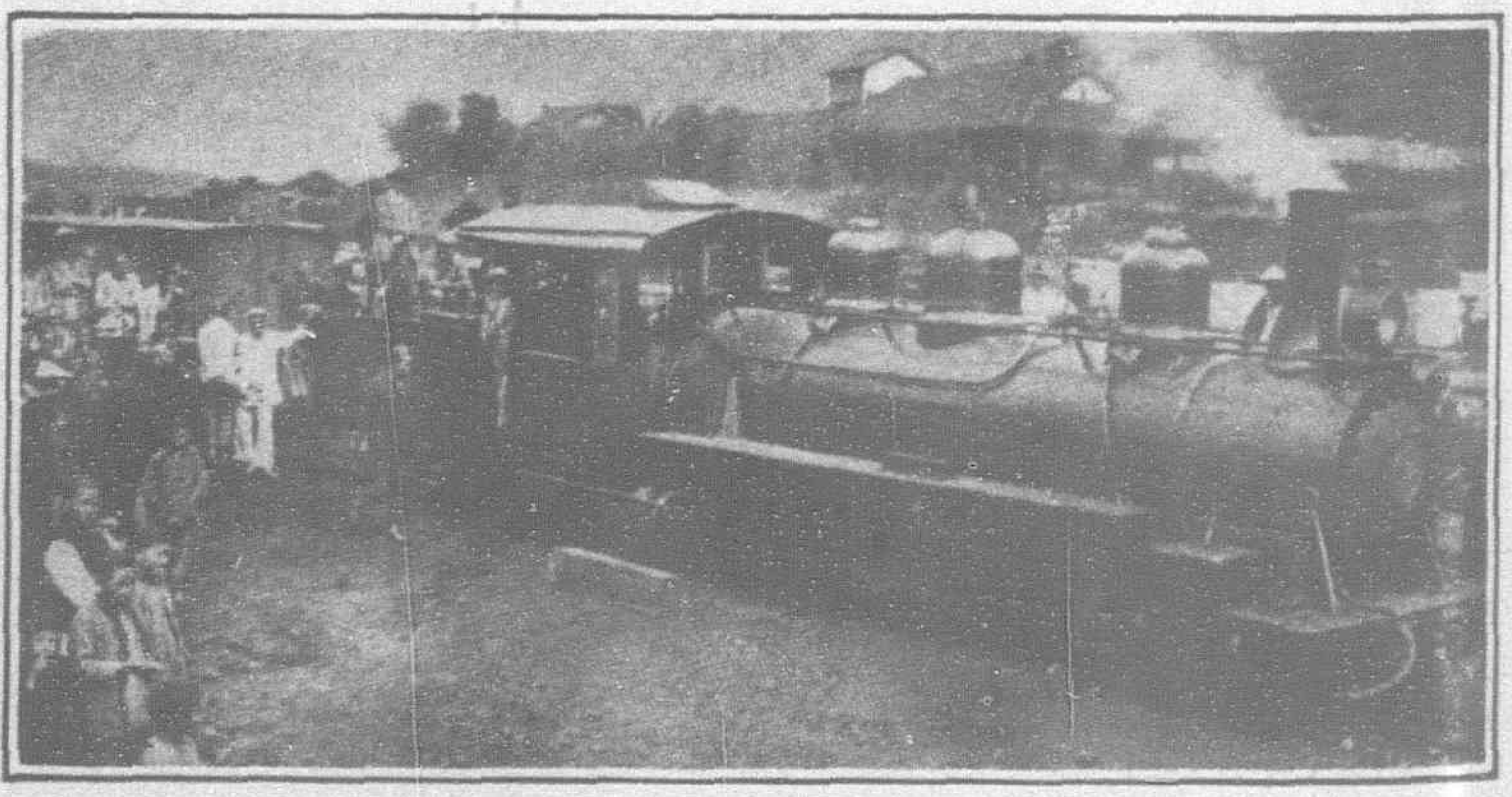
When it was first decided to build the railway, the money for its construction was obtained by contribution from the people who would expect to benefit thereby, the miners, fuel merchants, tin smelters, and the buyers; but in 1917 it was found that there would not be sufficient funds to complete the Railway, the final cost of which was over $5,000,000.00 Yunnan, and a bank was established having the Railway as its assets. This institution, known as the Yunnan Kopei Railway Bank, with headquarters at Kokiu and branches at Yunnanfu and Mengtse, has on its directorate many of the gentlemen that are also on the board of the Railway and the Tin Company. Its purpose was primarily the issuing of paper money for the work on the Railway. Permission was obtained from the Tuchun of the Province, Gen. Tang Chi-yao, to issue $500,000.00 Yunnan in notes. The first issue was most interesting in the printing arrangement, since instead of the regular, numerals in the corners these notes have "A" for five, "B" for ten and "C" for twenty, the one dollar notes being made by cutting the

Running Shed and Repair Shop at Mengtse



Cylinders	13-in. by 16-in.	Grate Area	20.2 sq. ft.	Weight Total Engine	64,700-lb.
Drivers, Diam.	28-in.	Heating Surface	834 sq. ft.	Tractive Force	14,700-lb.
Steam Pressure	180-lb.	Weight on Drivers	64,700-lb.		

Rolling Stock of the Yunnan-Kopei Railway. Erection of the 0-10-0 Type Baldwin Locomotives



Locomotive Number 17 on Her First Trip to Pechetchai Junction with the Yunnan Railway corners off of any of these notes. Later when more money was required, permission was obtained from the Tuchun for the issuance of another $500,000.00, and the notes were made by the American Bank Note Company. These notes are only negotiable along the Kopei Railway, where paper money is entirely in vogue, even to the ten and twenty cent pieces.

After the completion of the Railway and for its upkeep the Share Collecting Bureau was established at Kokiu, where all tin for export is taken for weighing and examination. For each Chan, about one ten and a quarter, the Railway collects about 100 Taels—25 Taels from the Smelters, 25 Taels from the Buyers, 7.5 Taels from the Charcoal Burners, and 42.5 Taels from the Tin Miners. This insures the Railway an annual income of from $350,000.00 to $600,000.00 Yunnan from this source alone, in addition to the receipts from passengers and miscellaneous freight.

The Railway shops at present located at Mengtse are able to take care of general car and locomotive repairs, but it is proposed to move them to Kikay as soon as the Lingan line is opened to traffic, and at that time to fit the shops with up-to-date machinery consistent with the repair work that they will be called upon to do.

The passenger carrying stock of the Railway consists of first and second class, third class, and fourth class cars built by the Yangtze Engineering Works, Hankow, China. Box cars and coal cars of 7.5 tons and 10 tons capacity are used. These cars have been supplied by American and French builders and the Yangtze Engineering Works of China. All cars are of the four wheeled-bogie type and are fitted with link and pin couplers.

The motive power of the Railway until 1925 consisted of 16 locomotives, all of approximately 9,000 pounds tractive force, and built by various makers as follows: 8 of the 0-6-0 Saddle Tank Type built by the Davenport Locomotive Works, U.S.A.; 4 of the 2-6-0 Side Tank Type built by Batingnolles, France; 4 of the 0-8-0 Side Tank Type Built by The Baldwin Locomotive Works, U.S.A.

As the locomotives in use did not have sufficient power to meet the growing needs of the railway, Mr. Chen, the President, requested The Baldwin Locomotive Works to design a locomotive to meet the Railway's unusual service conditions. To meet the demand for increased hauling capacity combined with a restricted loading gauge, a ten-coupled design with separate tender was proposed. An order for six locomotives was placed. These locomotives have proved capable of hauling 75-80 metric tons of cars and lading over the grades and curves of the Railway, at the same time maintaining a minimum speed of 9 miles per hour. It is also interesting to note that while hauling almost double the load of the smaller engines, the 0-10-0 locomotives show a very appreciable saving in fuel and water. These locomotives have proven so successful that the Railway has recently purchased 6 duplicate locomotives.

Shing Mun Valley Contract, Hongkong

THE construction of two tunnels and an open Conduit joining them, together with a Gauge Basin at the Southern end, is only part of the scheme designed to bring the waters of the Shing Mun River through and across the hills of the New Territories, which are leased by the Chinese to the British, to the Cities of Kowloon and Hongkong. The length of the North and South Tunnels are 2,160 and 4,680 feet respectively, and the South Conduit with tunnel approaches 2,000 feet.

Tenders were called by the Public Works Department of Hongkong in 1924, and the firm of Sir. W. G. Armstrong, Whitworth & Co., Ltd. were awarded the contract on 25th November of the same year.

The specified time for the completion of the works was approximately 18 months, but owing to considerable sickness amongst the European Staff and the Chinese Labour, a general Strike that affected the whole of the Colony for several months, and the fact that difficult and water-bearing ground was encountered in the North Tunnel for several hundred feet, the completion of the works was delayed about four months. The excavation for the South Tunnel Approaches and also for the South Conduit was commenced in January, 1925, and tunnelling was commenced as follows:—

North Tunnel - South end - April 1925
South „ - North „ - February 1925
South „ - South „ - April 1925

(a) The boring of the South Tunnel, which is the longest, was started from both ends, but the North Tunnel was only attached from the South end, as the North Face was very inaccessible, the side of the hill being almost sheer in this locality, and ths length of the tunnel being less than half of that of the South Tunnel.

The ground through which this tunnel was being driven was however found to be soft and water-bearing, which necessitated a considerable amount of heavy timbering and subsequent lining with concrete, this delayed the progress to such an extent that it was decided in November, 1925, to open up the North Face and drive from both ends. Owing, however, to certain modifications by the Engineers of the Plan for the Approach at this end, the heading was not commenced until June, 1926. The South Tunnel Headings were joined up early in July, 1926, whilst those for the North Tunnel were joined in the middle of August, 1926.

The error in the alignment in both tunnels was practically nil, being under 2 inches in each case, this was a very satisfactory result considering the rough and inaccessible country over which the surveys had to be made.

The drilling machines used were of the Leyner Drifter Type, with 1¼" round hollow steel drills, driven by Compressed Air. The pressure at the Power House was kept at 100 lbs. per sq. inch which resulted in a pressure of about 90 lbs. at the drill. The air main was 3" dia. the maximum length being over 3,000 feet.

A jet of water was maintained through the drills at a pressure of about 30 lbs, which eliminated dust, kept the holes clean and the drills cool.

Two drilling machines were worked in each face, mounted on a horizontal bar.

The length of the holes drilled varied from 3 feet to 5 feet, and the number in each round from 28 to 38 according to the class of rock encountered.

The holes for the cut were drilled round a central area about 4' 6" across with each pair of holes aiming to meet at a common point of 3' 6" to 5' from the Face.

The cut holes were loaded and fixed first and then the remainder of the holes.

Blasting Gelatine with electric detonators were used for the cut and Gelignite for the remainder, which were fired electrically in some cases, and by time fuze in others.

The average amount of explosives used throughout the work was 9 lbs per lin. ft of tunnel.

The material encountered throughout the full length of the South Tunnel was hard granite, but in the North Tunnel this was intermixed with decomposed granite and dykes of shale, which latter were very treacherous when exposed to the Air. The Power for driving the tunnels was provided by three single acting compressors with a capacity of 450 cubic feet of free air per minute, delivering at a pressure of 100 lbs per sq. inch. These were provided with after-coolers and receivers and belt-driven by three 115 H. P. Semi-diesel Engines. A Portable Air Compressor was installed at the North Face of the North Tunnel, which was capable of running one Leyner Drilling Machine at 80 lbs pressure.

Two Leyner Drill Sharpening Machines with Oil Furnaces were employed for sharpening the drills, as many as 600 drills were being dealt with by each machine in 24 hours.

Two electric generating sets with a total capacity of 16 K. W. and driven by Oil Engines were used for lighting and ventilating the tunnels. The whole of this electrical plant was duplicated to provide against stoppage of work by breakdown in the lighting and ventilating system.

The Cableways, 3,000 feet long each, were employed for transporting machinery, materials and stores from the main roads to the Works. These had a capacity of 5 tons, per hour with a maximum individual load of 5 cwts. per carrier.

Worthington Pumps, driven by compressed air, were employed for dealing with the water in the tunnels.

The excavation from the tunnels was handled by nine skips of 1 c.y. capacity running on a track with a gauge of 2 feet. Jackhammers were employed for poling back in the tunnels where the concrete lining was required, and also where the original headings had not been excavated to the finished section.

The average progress in all headings was 36 feet per week, the best weekly output being 55 feet in one week, working 3 eight-hour shifts each 24 hours.

Caravan Travel Across Mongolia

By V.P. Copping

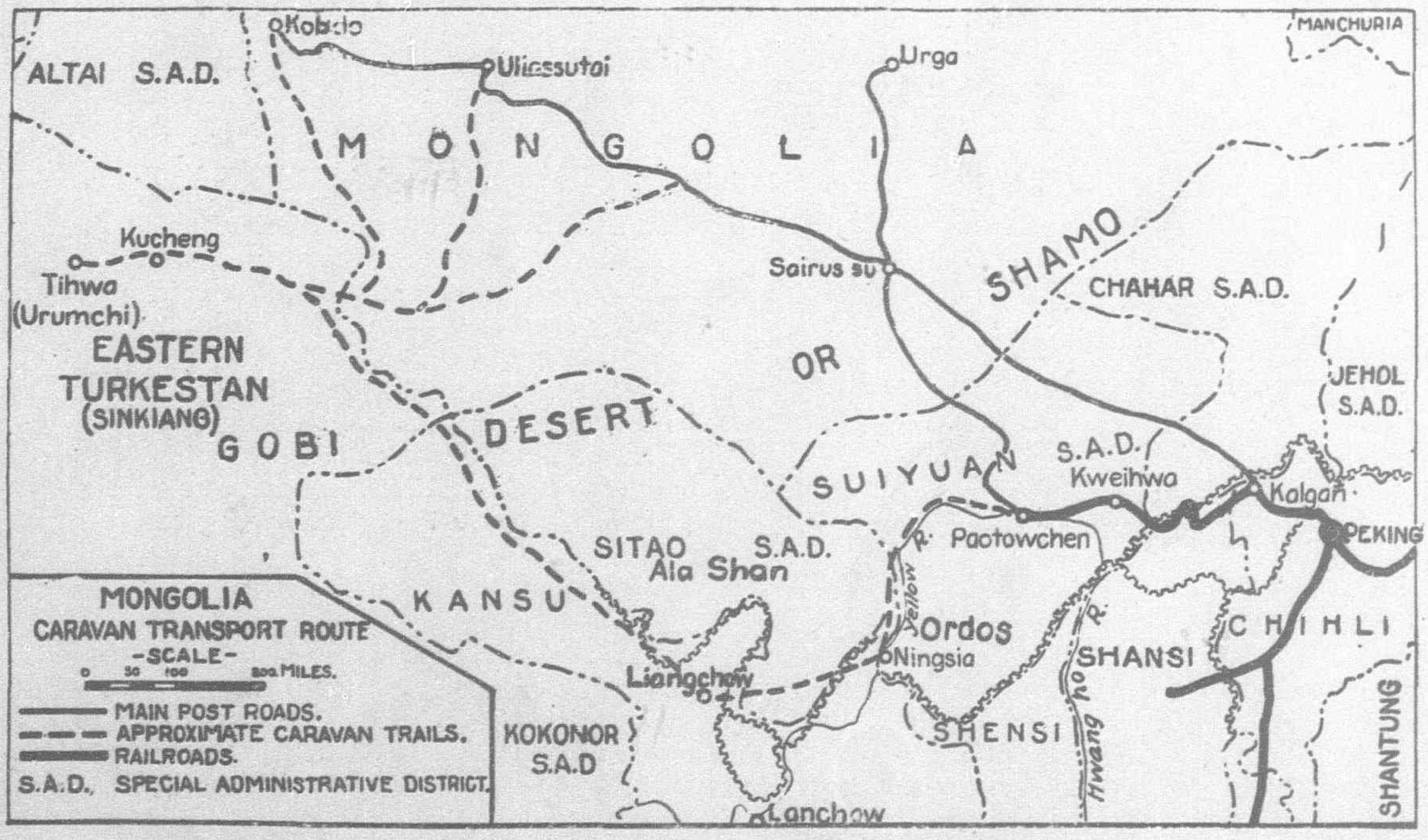
THE inadequacy of transportation facilities in China proper and the contiguous territory has long been a topic of discussion among those interested in Far Eastern trade methods. It would undoubtedly be desirable to have China and its great desert reaches to the north a network of well-managed railroads and numerous motor roads which would expedite the transfer of goods; but should a railroad ever blaze a trail across the Mongolian grasslands it would wipe out forever the present slow and ineffective but picturesque method of transportation by camel caravan. Any-one traveling in the neighborhood of Suiyuan Province, and, particularly, in the city of Paotowchen, in the spring or fall of the year will see endless processions of camels, laden with merchandise for the farthest parts of Mongolia and Chinese Turkestan, swinging silently on toward the desert lands which lie between them and their destination.

Caravan Crossing Mongolian Desert with Products of the West

Paotowchen the Entrepot for Goods—Assembled in Kalgan

Situated at the head of rail transportation on the Peking-Suiyuan Railroad, and on the Yellow River, which flows down from Lanchow (Kansu) for a distance of approximately 3,000 *li*, or about 1,000 miles, Paotowchen is accessible both by rail and water, and has thus become an entrepôt for goods in transit from China proper to Mongolia and Sinkiang (Eastern Turkestan). Every year the city is busy with camel caravans going to and from these places.

Merchandise destined for this long journey comes from foreign countries as well as from the interior Provinces of China. It is assembled in Kalgan and thence shipped down the Peking-Suiyuan Railroad to Kweihwa, or Paotowchen, to be transported by the ancient method of camel caravans. Cloth, brick tea, flour, sugar, cigarettes, ironware, matches, and kerosene oil are the principal commodities.



United States Participates in Trade—Normal Distribution

The United States is a fair contributor to this trade, supplying about 50 per cent of the kerosene and 80 per cent. of the flour anually re-exported from Kalgan, or about 4,000,000 pounds of flour and 400,000 gallons of kerosene. In recent years a small number of American automobiles have been exported to Kalgan, but they are used for military purposes rather than for the transport of goods. Some of the sugar, ironwares, and cigarettes also come from the United States. The cloth in mostly produced in Chihli Province and is of a very coarse quality.

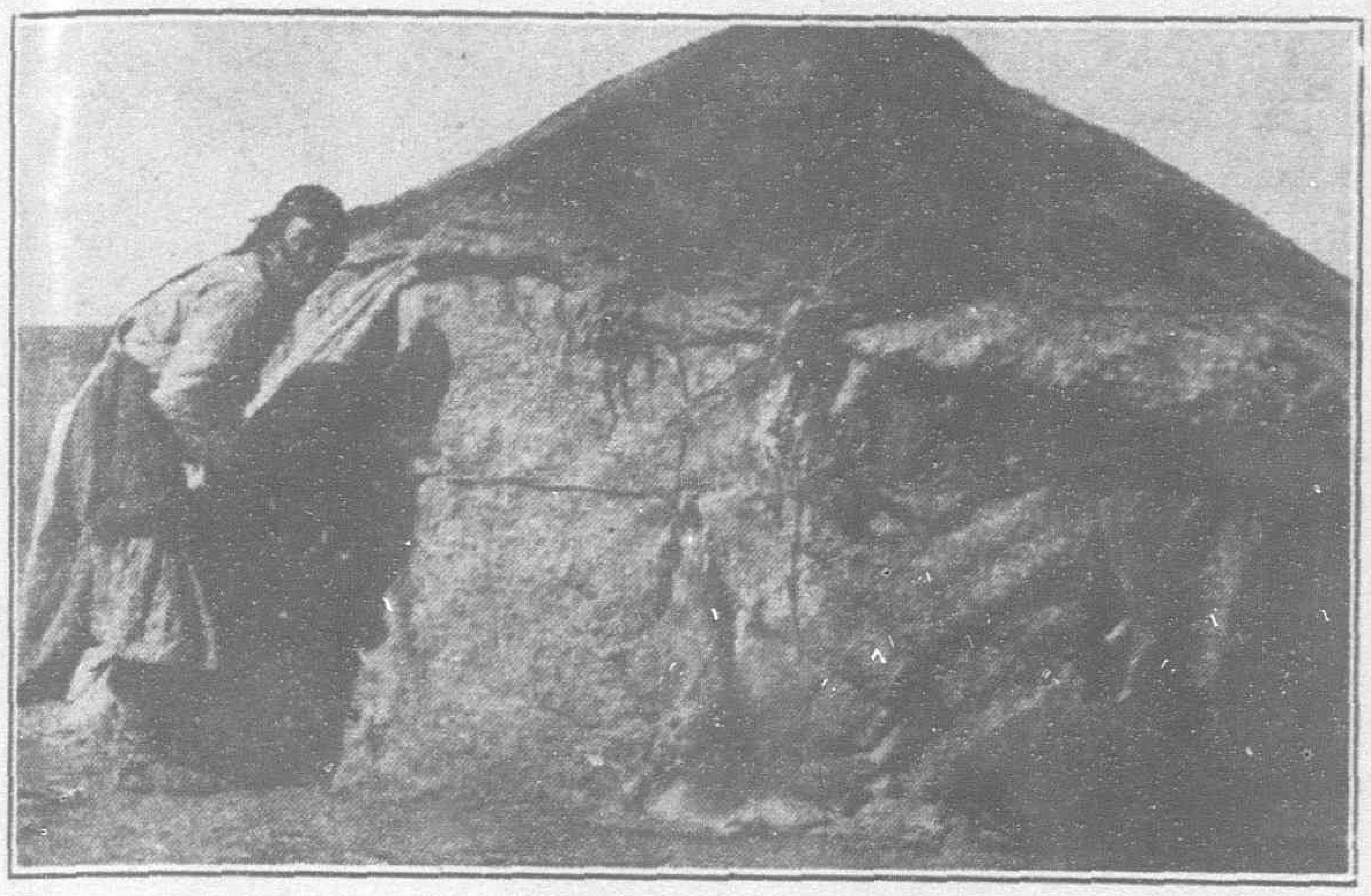
Recent military operations in northwestern China, particularly around the Peking - Suiyuan Railroad, have somewhat curtailed the movement of goods, but under normal conditions Paotowchen alone annually distributes throughout Mongolia and Sinkiang about 10,000 bundles of cloth; $300,000 worth of tobacco; $400,000 worth of cigarettes; 13,000 chests of brick tea; and 540,000 catties; or 720,000 pounds, of ironwares; a large proportion of the kerosene oil and flour mentioned, and a small amount of sundry goods.

Extensive Caravan Business from Paotowchen

Upon reaching Paotowchen, the merchandise is turned over to certain traders for further redistribution. There are about 30 such traders who carry on an extensive business. The more prosperous ones generally own anywhere from 200 to 800 camels, while others hire the animals from local caravaneers. In the late spring the animals are turned loose on the Mongolian pasture lands and resume work again in the fall, thus avoiding traveling in the summer months, which is the rainy season in Mongolia. Along about September they are brought in from the pasture lands and packed with wares ready for delivery to Sinkiang and points en route in outer Mongolia. Each camel usually carries two packages of 140 catties each, or a total burden of nearly 400 pounds.

Northern Route Through Nomad Villages

Radiating from Paotowchen are numerous caravar routes. A very important route runs to Urga in Mongolia, and is a well-beaten track from centuries of use. There are two well-traversed



A Mongolian "Yurta," the Nomad's Home

routes—the northern and the southern—from Paotowchen to Kucheng and Tihwa (Urumichi), important trade centers in Sinkiang. The northern route follows the Peking-Urga trail, running directly north until it intersects at Sairus su with the main post road going from Kalgar to Uliassutai and Kobdo in outer Mongolia. The early part of the journey is over Mongolian pasture lands. On the way small Mongolian villages are passed and caravaneers barter wares with the inhabitants; but the wants of these Mongols are few. They are a nomad people who prefer to leave agricultural pursuits to the Chinese while they herd cattle from the saddle of a pony and move from place to place in search of new grass lands. Their houses are on the order of tents, called "yurtas," made in circular fashion of lath or cane framework covered with felt. They are collapsible, so as to be easily moved when it is time for the semiannual migration to new grazing grounds. The Mongols supply Paotowchen annually with approximately 90,000 sheep, 10,000 horses, 9,000 cattle, and a large number of camels.

From the Kalgan-Kobdo post road there are several trails dropping south to Kucheng and Tihwa, where the camels are unloaded and the traders exchange their goods for the wool, skins, furs, and sundry goods of Sinkiang.

Southern Route via Ala-Shan

The trip by the northern route covers approximately 5,300 li, or nearly 1,800 miles, and takes about 70 days. In view of the heavy transit tax, and, sometimes, ill treatment at the collectorates in outer Mongolia, however, some caravaneers prefer to go to Sinkiang by way of Ala-Shan, along the Kansu border. This is the popular southern route. The journey is circuitous and requires about 100 days. It is divided into a little over 60 stages, each 20 or 35 miles from the next. The first two sections of the trip, from Paotowchen to Ningsia and from Ningsia to Lanchow, may be made by motor bus, although from Ningsia to Langchow the going is exceedingly difficult because of the high passes and desert stretches. When the trip is made from Paotowchen entirely by camel caravan, a route running farther north of the motor route, through the Ordos territory, is used, as fodder for the animals can be obtained more readily in the Mongolian steppes. This route follows the Kansu border into Sinkiang.

In 1924 Sinkiang and Mongolia transported to China, by this method, 13,876 loads of skins and furs and 5,729 loads of sundry goods.

How American Flour Gets to Gobi

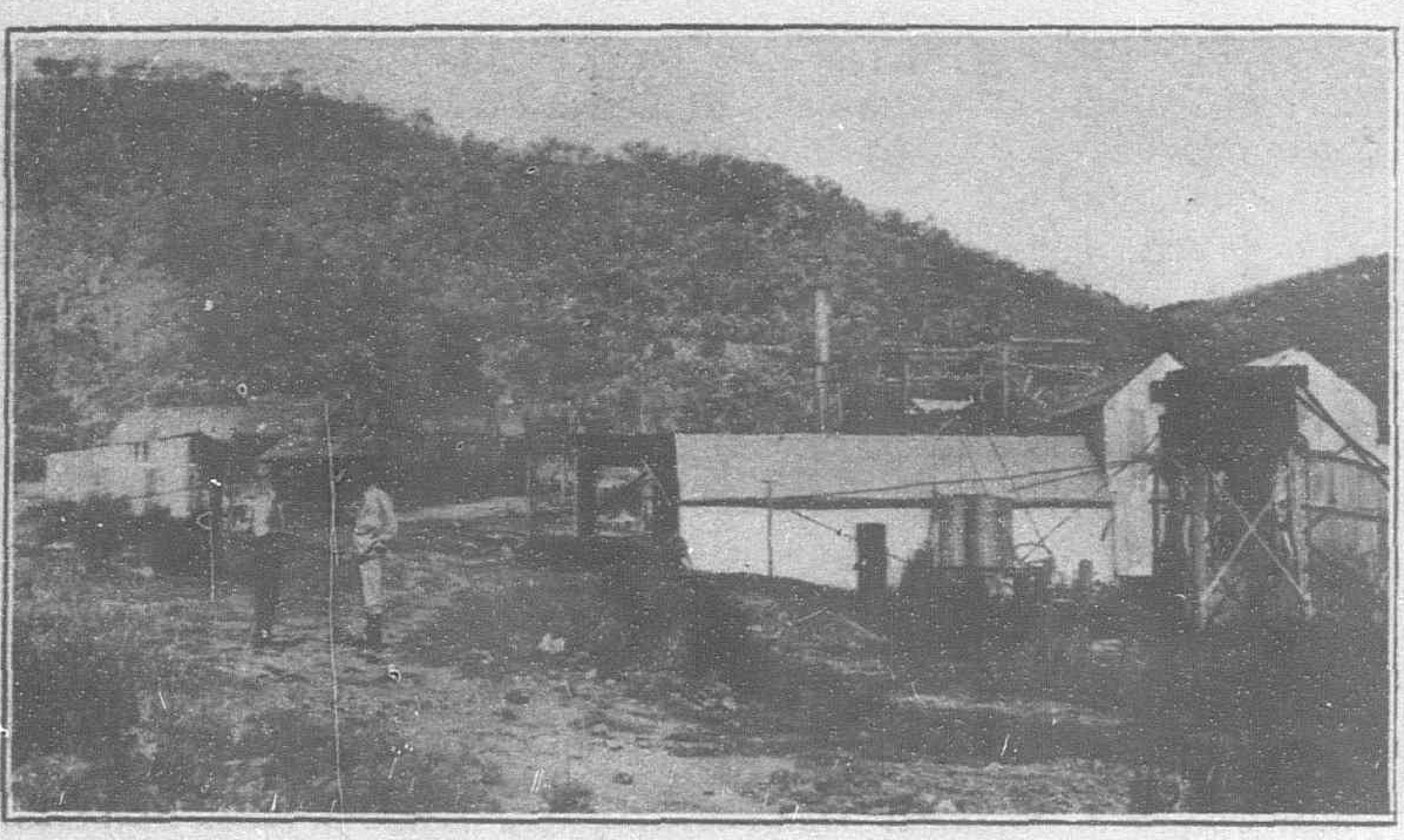
IN a recent issue of *Commerce Reports*, the weekly publication of the Department of Commerce, is presented an interesting account of an incident of the adventures and conquests of modern world trade. When the report says that 80 per cent. of the flour and 50 per cent. of the kerosene that go into the Gobi Desert region and enter Mongolia are furnished by the United States it records a matter of trade statistics. Back of that record lies the fact that these American products are carried across China, now a land virtually without a government, ravaged by civil war and devastated by bandits and gangs of marauders, by railway to the furthermost terminals of the iron rails, and there loaded upon camel caravans for transportation into a country that most Americans know merely as a place name on the map and where few even of the most adventurous travelers penetrate.

Rapid Transit in the Gobi

The goods, which are landed at ports on the eastern coast of China, are reloaded on the railroads and sent through Peking, and from there west to the Mongolian border. If the train is not commandeered by some local tuchun or looted by bandits it reaches, first, Kalgan, where the shipments are redistributed and in part sent by caravan over the ancient trail to Kobdo. The remainder is carried some 300 miles further westward to Paotowchen. From this point radiate numerous caravan routes; one goes north to Urga; another, 1,800 miles long, goes almost to the Siberian border, and another crosses the Gobi Desert to eastern Turkestan. Besides such necessaries as food, oils and ironware, there are distributed from Paotowchen annually cigarettes valued at $400,000 and tobacco in other forms valued at $300,000.

The caravan trade is well organized; there are thirty men who practically control it and each owns from 200 to 300 camels, all of which they use during the height of their season. Each camel is expected to carry about 400 pounds. The caravans consist sometimes of as many as fifty of these burden bearers, and besides the camel drivers they are sometimes accompanied by a considerable armed guard. The size of the larger caravans and the display of arms usually save them from desert marauders, outlaws who prey mostly upon the smaller and unguarded expeditions. On their return from the interior the caravans bring wool, pelts and native manufactures of Sinkiang province.

By these caravans the United States sends into this remote region annually about 4,000,000 pounds of flour and 400,000 gallons of kerosene, and in exchange receives strange Mongolian pottery and wares and a store of raw furs and skins from the northern Siberian wilds.



Sundown Arsenic Ore Works

Section of the Prickly Pear Poison Works

Arsenic Mining in Queensland

Solving the Problem of the Spread of Prickley Pear

By Thos. J. McMahon, F.R.G.S.Q.

A TASK of a gigantic nature confronts Australia in the eradication of the Prickley Pear, a plant formerly brought to the country as an ornamental hegding for private gardens, but now by law declared a pest. The pear has spread in the most remarkable manner, over the Commonwealth, particularly the Eastern States; it has covered tens of millions of valuable acres, fit for pastures and agriculture, and the estimated cost of its eradication is now computed at the sum of over 400 million dollars.

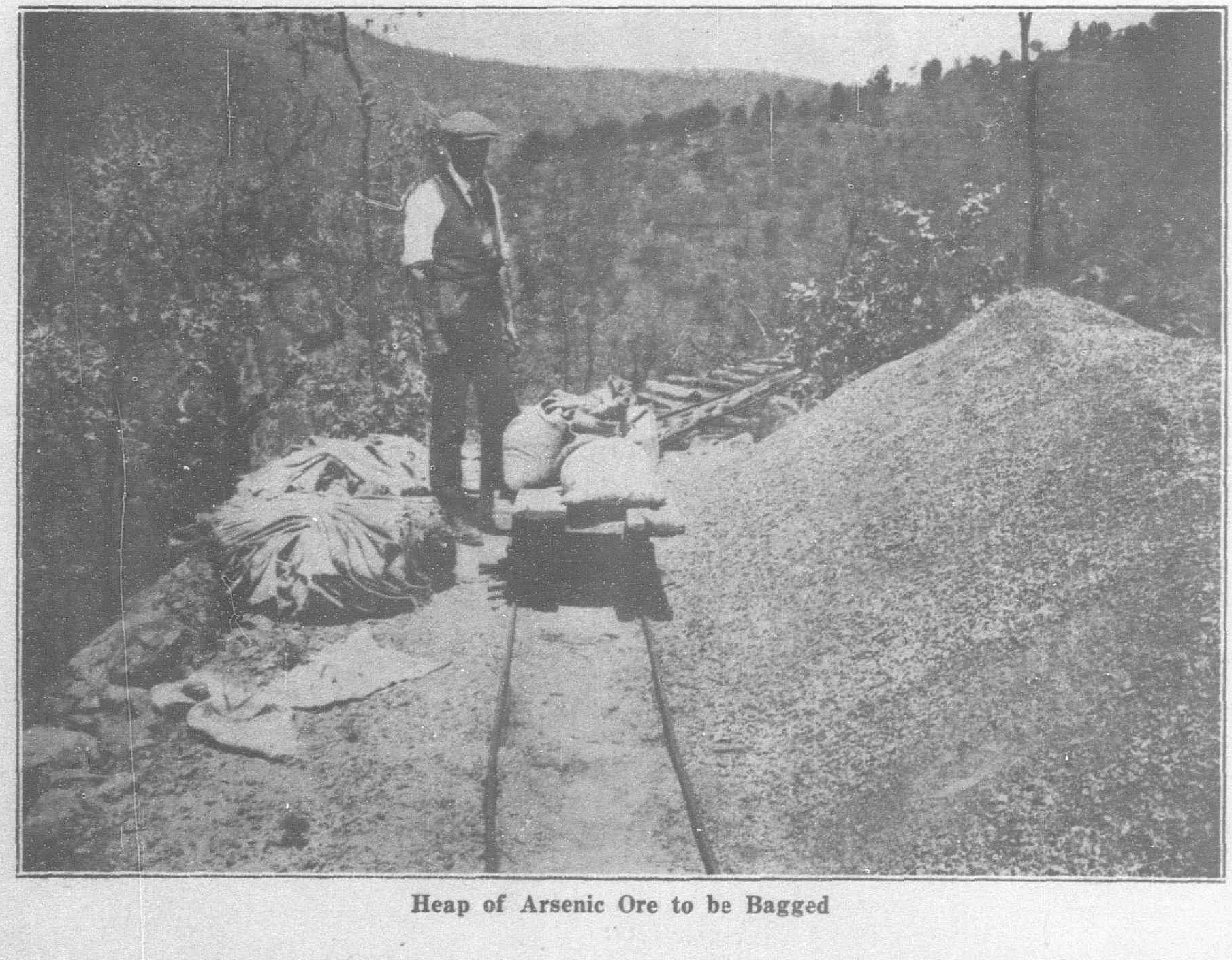
There are areas running into 20 to 50 and more square miles, so thickly infested, they are impenetrable, so solidly clustered are the plants. It is reckoned if the Prickley Pear of Australia could be massed as a bulwark round the coast line of the Commonwealth, it would offer the best opposition to invasion.

Birds and Marsupials are the main distributors of this blighting plant; in a year, even in the periods of drought, thousands of acres can be covered with the pest. It has become so formidable in its spread, so detrimental to settlement and development, that its eradication has become a national matter, and Governments are greatly exercised how to face and combat it.

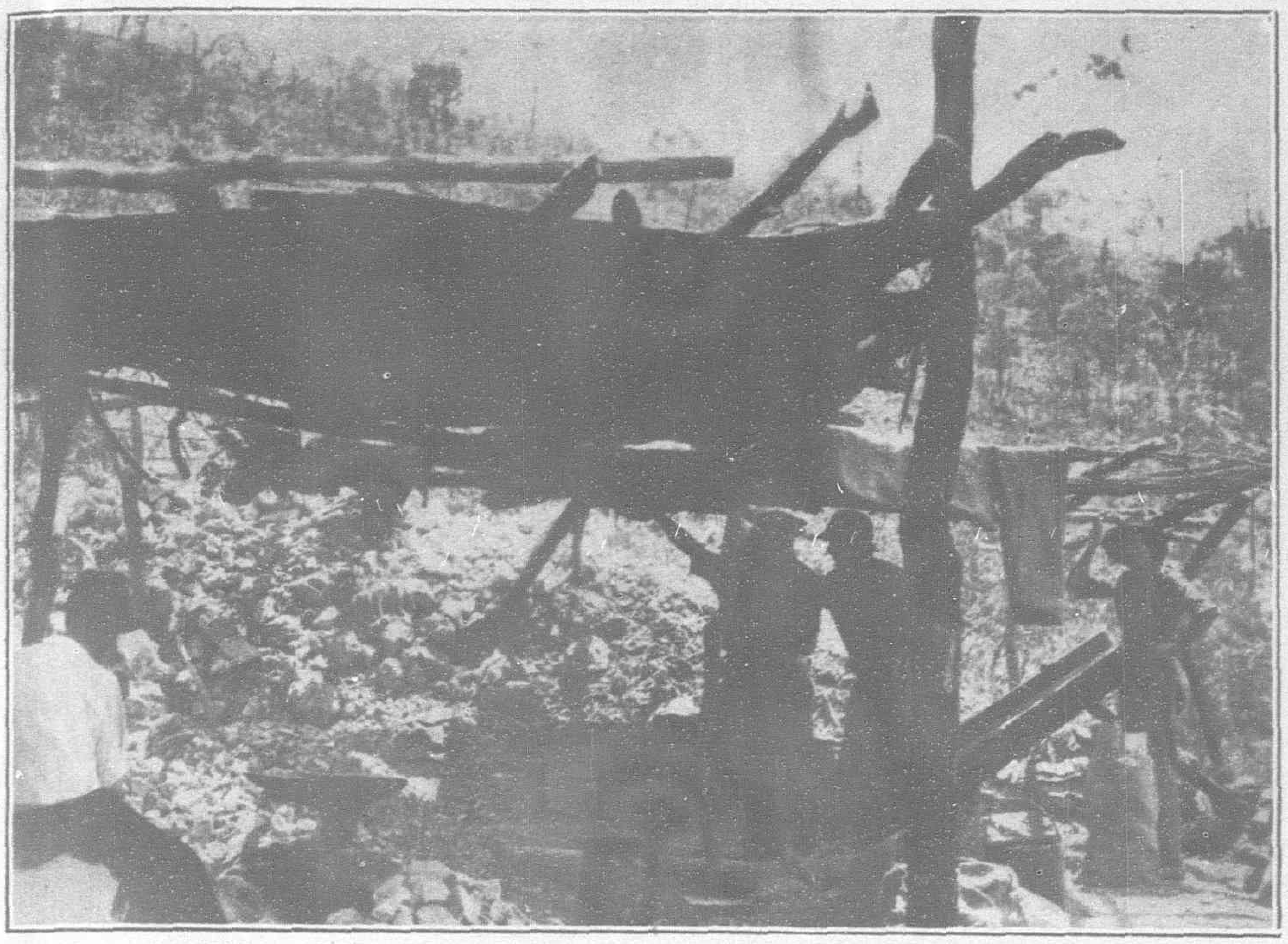
For many years various efforts and remedies have been applied, in the way of Cochineal insects, poison sprays, wholesale digging and burning. Thousands of pounds have been offered in rewards for discoveries of remedies, and tens of thousands of pounds have been expended experimenting in remedies.

Governments are offering vast areas of infested lands to settlers and at mere peppercorn rentals, almost indeed free, but the pear baffles all attempts to dislodge it in anything like a big way.

Some ten years ago an American, O. C. Roberts by name, attracted to Australia by the reports of the ravages of the Prickley Pear, sensed the fortune that awaited the inventor of some effective means of cheap destruction. It was essential the remedy applied should be cheap, inasmuch as there was so much pear, and the farmers and squatters, so disheartened by so many ineffective remedies, would not consider anything of any cost. In course of time, and years of experiment, and entirely working on his own finance, Mr. Roberts put upon the market a spray known as "Roberts Pear Poison." Supply was limited and sales discouraging. Presently Roberts gave the market "Roberts's Improved Pear Poison"; its power and cheapness of destruction were quickly recognised, and a well financed company was formed to manufacture



Heap of Arsenic Ore to be Bagged



A Tunnel Station at the Mouth of an Arsenic Mine at Becroft

the product. But the chief ingredient was arsenic, and the lack of quality and quantity of this mineral made it for some time very doubtful if the poison could be supplied in any big quantities, and as the demand was already showing. That was five years ago, and the first year's sales was only 50 tons. Arsenic in unlimited quantities and the purest quality must be assured before any further business could be done or any money spent in the erection of Poison works.

Prospectors had been out for some considerable time searching for indications of arsenic; the mineral was found in small quantities in conjunction with other minerals, but of no extent, though the quality in every instance attracted attention, being of the purest, and unrivalled in the world.

Fifty years ago, what is now known as the "Granite Belt," or Stanthorpe district of Queensland, was famous for its tin mining. An old miner noticing the demand for arsenic, remembered that in conjunction with the high quality tin found in what was an exceedingly rich portion of the mining field of the "Granite Belt," and known as the "Sundown Area," produced large quantities of arsenic, and which not thought at the time of any particular value, was practically given away with the tin. The old miner renewed his acquaintance with the old field, searched the mountains that surrounded the deep valley of the "Sundown," and one morning awoke to the realization he had discovered, what is still thought to be true and possible, "whole mountains of arsenic." O. C. Roberts was quickly on the field; his investigations were completely satisfactory, and, in short, in less than twelve months several mines were in full work, and extensive Poison Works were being built at Wallangarra, the railway terminus and junction of the Queensland and New South Wales railways, on their way from Brisbane, the capital of Queensland, to Sydney, the capital of New South Wales, and so connecting with all the Southern and Western States of the Commonwealth.

Ever since enterprise has opened new mines, and in every instance the quality of the arsenic has been consistently 99 per cent. pure arsenic.

The Queensland Government, constantly reminded by the complaints of settlers of the continued spread of the Pear, particularly on Crown lands which were eventually to be remunerative in bringing in rent, rather greedily commandeered a very extensive portion of the mountains of the "Granite Belt," and that portion thought to contain the greater amount of arsenic. This portion was called "Jibbenbar," and is 20 miles away from the Roberts proprietary mines called "Becroft."

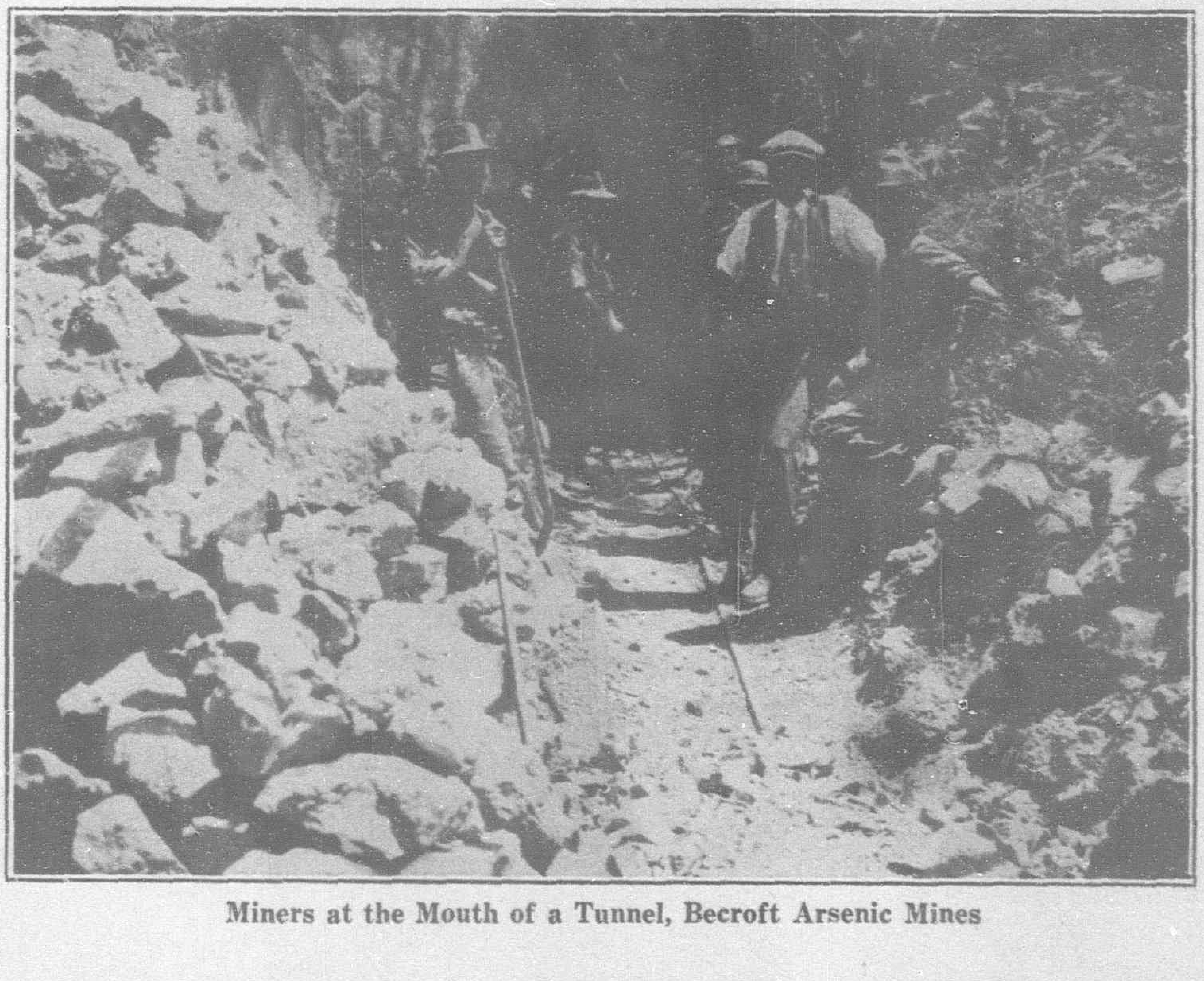
A most interesting contrast is presented in the enterprises, Government and private. Financed in the most liberal manner, with extensive plant and machinery and hundreds of men employed, gave the Government management every opportunity of success and profit. This has failed; strike after strike prevented any hopes of profit, and to-day the mines are practically so little worked, they are regarded as a "white elephant," utterly useless and a burden upon the taxpayer.

On the other hand, the Roberts Proprietary, or private enterprise, has been eminently profitable and successful, and it is these mines to-day that are producing the amount of arsenic required to keep the Poison Works at Wallangarra in full working order, and maintain the supply of spray on demand.

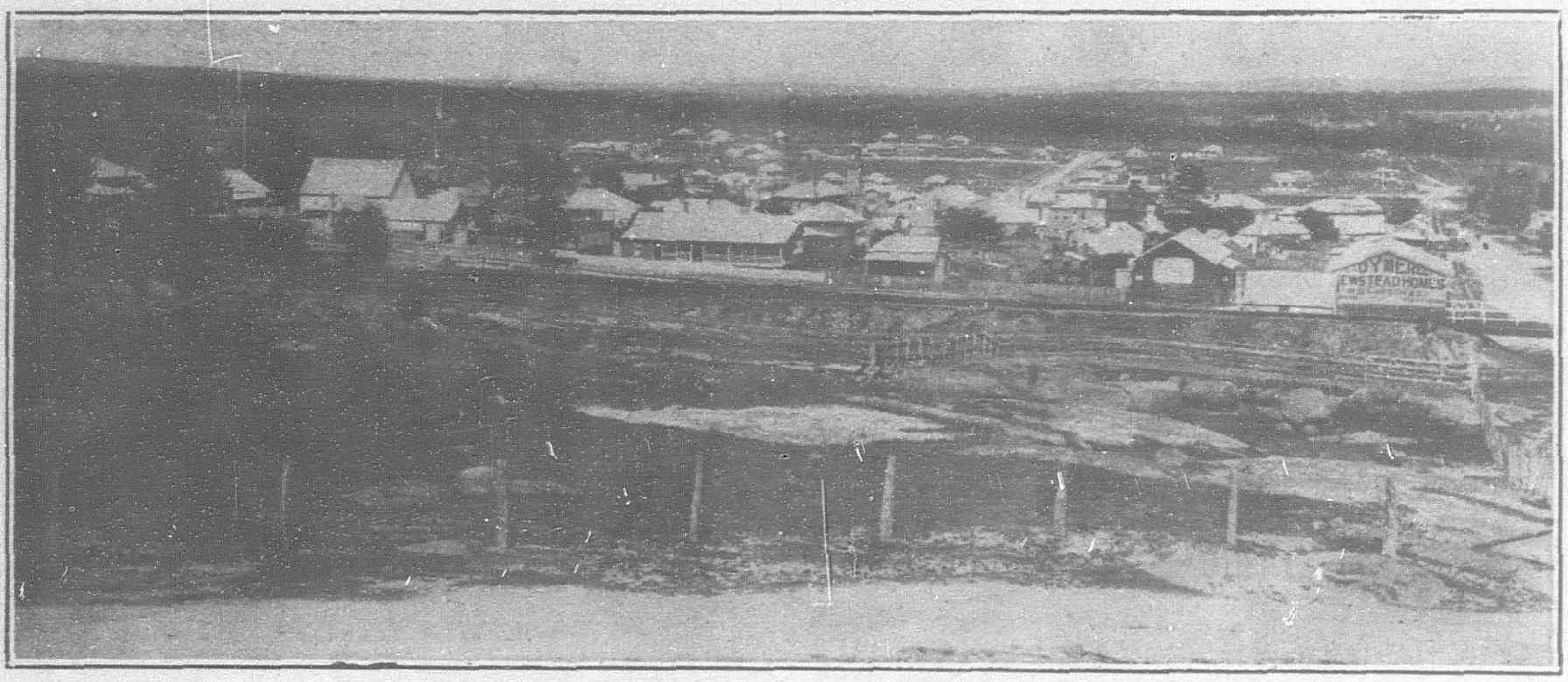
The Roberts Proprietary, Limited, however, whilst continuing its name and management, and apparently the first private enterprise, has passed to a new control, that of the "Prickley Pear Commission." This is a body appointed by the Government of Queensland and given carte-blanche to conduct works and mines, and use its powers and abilities in eradicating the Pear. A sum equal to a million dollars will be placed by the Government yearly at the use and discretion of the Commission; it will carry on as if a private concern, but must show annually effective and permanent work has been accomplished.

New works are to be built almost immediately and within a few miles of the Becroft mines, a railway will also possibly be constructed to the foot of the mountains under the vicinity of the mines, and a plant erected whereby the arsenic ore will be sent down direct from the mines to railway loading stages, and placed on trucks to be carried away to the works. At present motor transport is used in carrying the ore, and in the steep grades of the roads running over the mountains this entails both time and danger. Horse teams are sometimes used, but these are very slow, and quicker methods of handling the ore are now insistent.

The Becroft mines, like those owned by the Queensland Government, are situated in a cluster of wild and romantic mountains, in the early days the haunts of notorious bushrangers and cattle and



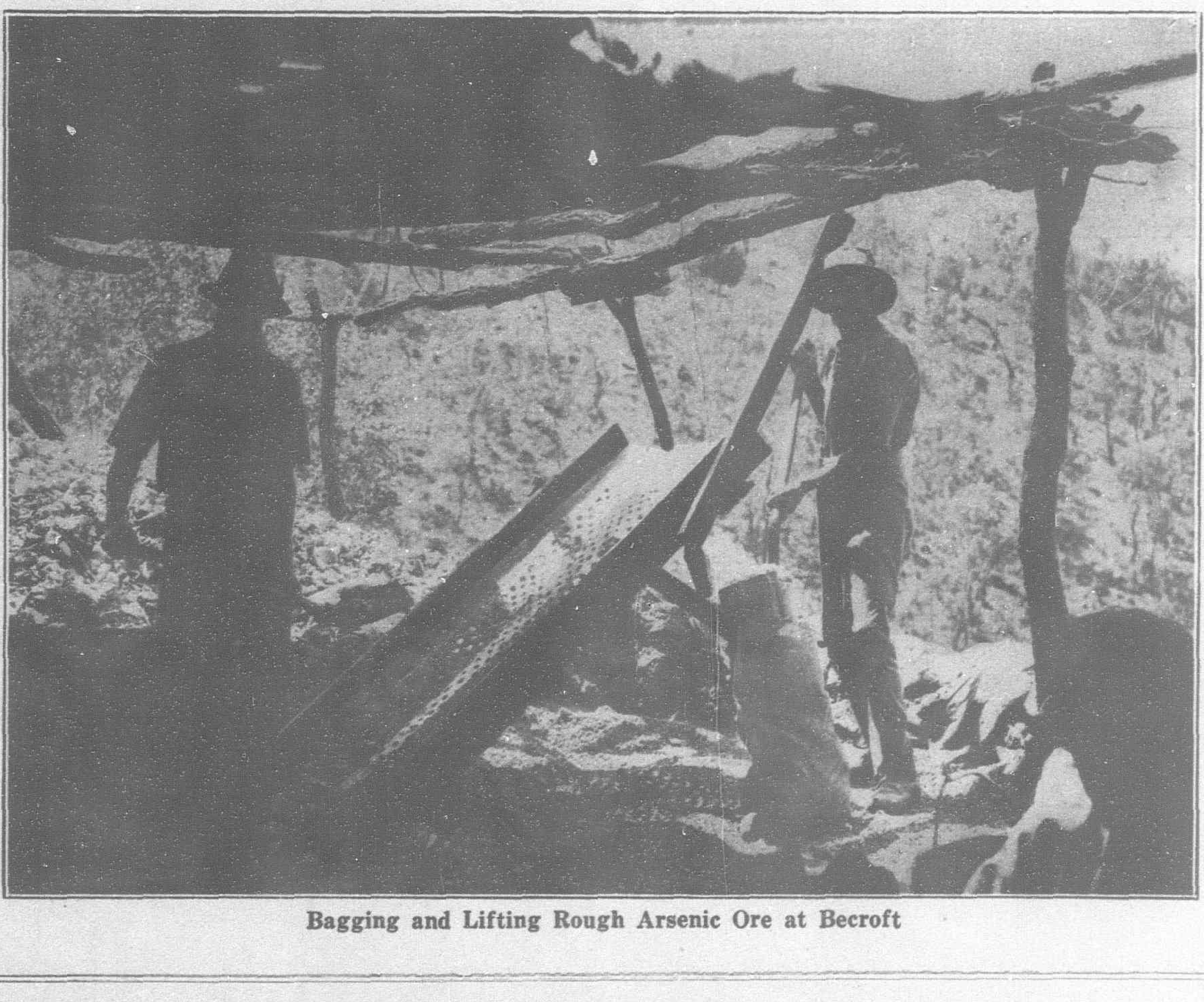
Miners at the Mouth of a Tunnel, Becroft Arsenic Mines horse thieves. A main road leads over the summits of several hills exceedingly narrow, and in most parts on one side dropping sheer down for many thousands of feet. One short portion of about half a mile, and termed the "Razor Back," is a perilous climb on a tableland between two summits, and on both sides of the road there are deep, dark valleys, looking so far away as if belonging to some subterranean world.



The Town of Stanthorpe

The Becroft mines are from any distance hardly noticeable; there is usually just rough bough sheds at the mouths of the tunnels running straight into the hillsides; shafts are seldon sunk, tramways run into the mines, and the dull grey mineral in huge blocks, always dug out, is sent to the tunnel sheds, and there broken into small pieces bagged in one hundredweight lots, then sent by tramway to loading stages on the main road. Here the ore is broken up to pebble size, again bagged, and then carted off to the works.

The process of turning out the pure arsenic, by means of special furnaces is a carefully guarded secret. Dull grey of colour when sent to the furnaces, the arsenic is returned to binns a snow white, so much resembling the purest flour, and so much so, a notice is placed in a conspicuous part of the bin rooms reminding visitors "You cannot make a meal off arsenic."



Bagging and Lifting Rough Arsenic Ore at Becroft

At present a thousand tons of arsenic is produced monthly at the Wallangarra works, and the demand for more is taking a new phase in the demand from America, arsenic, it is understood, being an important factor in a remedy being applied to rid American cotton of the Boll weevil.

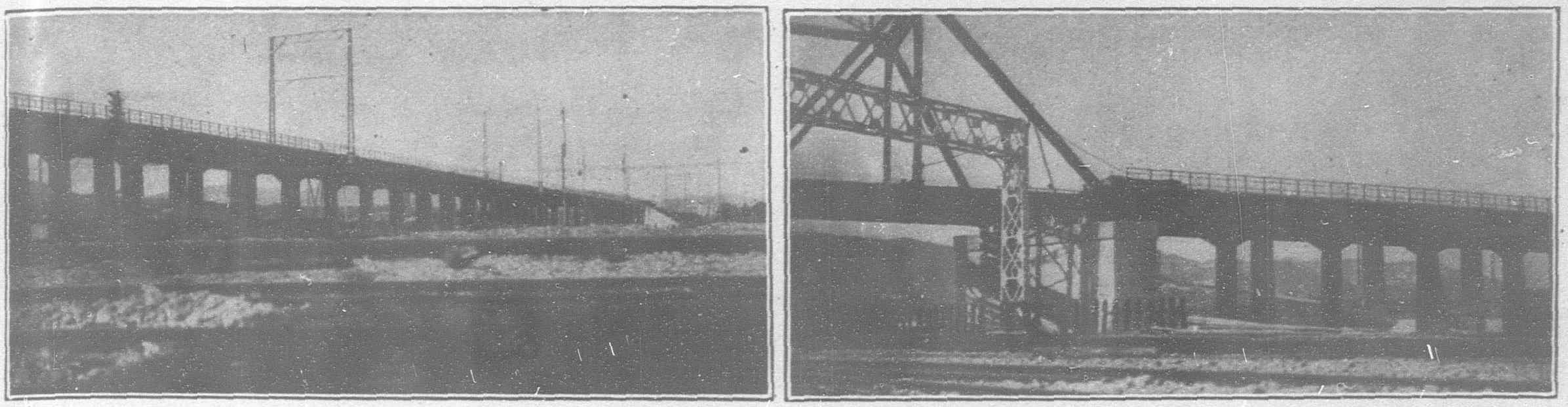
Like the process, the recipe of Roberts' Prickley Pear Poison is a strictly held secret; the fact, however, is evident: it is a remedy for the pear that is most effective. Quickly made soluble with water, and sprayed over the pear in the course of only a few hours, especially if a strong sun is pouring its heat down on the area being treated, the pear turns brown, dries and withers, and is then easily raked into heaps and fired. The cheapness of the poison is attractive to the landowner in the fact so little labour is required to work it: one man can spray, clear and burn several acres in a week.

All Australia is interested in the "Prickley Pear Commission" of Queensland, and its success will cause all other States to engage in the enterprise of Poison Works, and a wholesale eradication of the Pear Pest. This will then become a national industry, employing thousands and expending yearly millions of pounds sterling.

Unification Impossible Without Transportation

H. G. Wells discovers "a modern, self-conscious Chinese nationality" arising from civil war, brigandage and hatred of foreigners. "A living Chinese nation has appeared in the world," says Wells. "Not yet," answers Brisbane. "It takes more than hatred of foreigners and fighting amongst groups to make a nation."

Some day China will be a great nation, but it will come only after unification and years of stable government. Unification is impossible until the trunk railways are built that will weld together the distant provinces and facilitate the movement of troops for the maintenance of internal peace. The short-sighted policy of the Peking governments in confining railway construction to the provinces north of the Yangtze has made feasible the triumph of Canton in the regions South of the River. It has never been possible for the Northern armies to wage a successful campaign against Canton from their bases in the Yangtze Valley. As Canton has remained independent, so has Yunnan defied successfully the Central authority. Szechuan is semi-independent. Without railways, China will never be welded together under one government.



The New Viaduct

Y.1,200,000 Viaduct

THE Osaka-Kobe Electric Express Railway Company familiarly known as Hankyu have recently completed the extension line from Nishinomiya Higashiguchi of the trunk line connecting Osaka and Kobe to the Imazu station on the Osaka-Kobe Electric Railway Company line (familiarly known as Hanshin) which run parallel with the Hankyu line between the two port cities. The two parallel line is thus connected with each other about the middle of the lines.

The striking feature of this one-mile extension line is that almost entire section is elevated. A viaduct built over the quadruple lines of the Imperial Government Railway, and the newly built Osaka-Kobe state highway measures 2,838 feet in length.

The cost of construction is Y.1,200,000. The iron materials used were supplied by the Osaka Rolling Stocks Manufacturing Company, and the building work was carried out by the Obayashi-gumi builders.

New Sub-Stations Surrounding the Greater Tokyo

IN order to perfect the continuity of service for power supply the Tokyo Electric Light Company completed a ring form transmission network of 66,000 volts around the greater Tokyo in August last year. Around the inner line, the Company is at present further building another ring form transmission network of 150,000 volts. The two networks, the inner and outer lines are to be connected with Kameido Sub-Station now in operation as well as with the three new sub-stations, namely Hatogaya, Asahi and Hanahata.

The following show the outline of these sub-stations :

Kameido Sub-Station

Location :	Komatsugawa-machi, Tokyo-Shigai
When completed :	December, 1922
Condenser Motors	Makers-Westinghouse, Capacity —15,000 KVA, 11,000 volt, 6,000 R.P.M. There are three sets now in operation, and five sets more are to be added in the future.
Transformers	Makers—G.E. Single phase 1,500 KVA Primary voltage 80,800 V Secondary voltage 22,000 V Thirdly voltage 11,000 V
Distributor	Makers—Westinghouse
Lightning arrester	Aluminum Cell Arrester

Hatogaya Sub-Station

Location :	Hatogaya-machi, Kita-Adachigun, Saita-ma-Ken
When completed :	November, 1926
Condenser Motors	Makers—G.E. In addition to one set now in operation, four more are to be added in the near future. Capacity—25,000 KVA., Voltage—11,000 V., 600 R.P.M.
Transformers	Makers—Westinghouse, Single phase 25,000 KVA, Shell type, Primary voltage 80,800 V Secondary voltage 66,000 V Thirdly voltage 11,000 V There are three sets at the present moment, and three sets more to be added in the future.
Distributors	From Westinghouse
Lightning arrester	Oxcide film arrester

Asahi Sub-Station

Location :	Asahi-mura, Tachibana-gun, Kanagawa-ken
When completed :	November, 1926
Condenser Motor and Transformer	The makers and the descriptions are as same as those in Hatogaya Sub-Station. Two motors are now in operation, and two sets more are to be added in the future.

Hanahata Sub-Station

Location :	Hanahata-Mura, Minami-Adachigun, Tokyo-fu
When completed :	January, 1927
Condenser Motor and Transformer	The makers and the descriptions are as same as those in Hatogaya Sub-Station.

Bethlehem Steel Ties

The Bethlehem Steel Company has issued an interesting catalogue on steel ties. They explain the development of "Standard" mine ties as follows :

The development of the Bethlehem Standard Mine Tie is the result of our experience as a user and manufacturer of mine ties covering a period of more than ten years. This tie is a decided improvement in mine tie construction and one that will reduce coerating and maintenance costs. Features of the Standard Tie inplude :

1. Double fastenings
2. One clip in reserve
3. One-piece construction
4. Easily and quickly installed
5. No special tools required
6. No extra parts required
7. Readily portable
8. Gives increased head-room
9. Installed without taking track apart
10. Saves time and increases production
11. Long life.

Engineering Notes

Civil War Affecting Automotive Trade.—General conditions in Central China during the third quarter have not been favorable to the automotive trade except in the treaty ports, and even there business has shown a considerable decline. The civil warfare during the latter part of August, resulting in the capture of Hankow by the Cantonese armies has unsettled business through the Yangtze Valley and slowed up buying particularly among the Chinese. Although the automobile trade was materially assisted in North China during the early part of the year on account of the possibility of using motor vehicles over the area in which fighting occurred, the war in Central China has had the opposite effect, as the country is of such a nature as to render extensive use of motor vehicles impossible. All factors considered, however, sales of passenger cars in Shanghai held up extremely well during the period under review.

Truck sales have not been particularly good on account of the uncertain political conditions and the consequent hesitancy on the part of the merchants to enlarge their delivery facilities.

Stocks on hand are fairly high for this time of year, and prospective purchasers are inclined to postpone their buying pending the arrival of new models. With the appearance of several new cars on the market and changes of agencies for others competition is growing keener.

The general outlook for the last quarter of 1926 is favorable, but increased competition is anticipated and there is a possibility that prices may be somewhat shaded on the lines in which the keenest competition occurs.

Shanghai Building Modern Offices.—During the past eight years Shanghai has witnessed a greater activity than any other city in China. Scores of up-to-date business buildings and industrial plants, and hundreds of modern residences have been constructed, as well as apartment houses. Several very large office buildings are under construction and the six or eight story business building or apartment house is no longer an unusual type of edifice. Shanghai's development in all directions has warranted these operations.

The city has developed into the most populous community in the whole of China. Its present population is estimated at 2,000,000, which includes the international settlement, the French concession, and the Chinese sections. It cocupies a very strategic location—at the base of the Yangtze Valley, with a population of nearly 200,000,000. The population of the Yangtze delta itself, an area of about 50,000 square miles, is estimated at 40,000,000. The Yangtze Valley may be rightly characterized as the backbone of China and Shanghai is at its outlet. The city's continuous growth in commercial and industrial importance, therefore, is anticipated.

Business building operations have been proceeding at such a rapid pace, however, that with the completion of present and projected construction the available office space may be in excess of the demand. This should mean a reduction in rents. It should also result in the vacating of offices in antiquated or old-time structures. This tendency to take quarters in modern buildings is inspiring landlords who have old-style properties to replace them with modern structures. The city, consequently, is undergoing a process of modernization, but as the new buildings which replace the older structures are much larger and better equipped the actual office space available is being increased at a pace perhaps beyond the actual demands of the city.

Engineering Prospects in China.—Prospects for engineers in China were discussed by Mr. R. L. Sarjeant in a lecturette delivered before the Junior Institution of Engineers, on October 15. Mr. Sarjeant gave an idea of the difficulties both racial and technical which kept the conditions of life in China is such an elementary state. There was entire lack of co-operation amongst the Chinese, he said, and there were no really practical native engineers, only some highly trained technical men, of the class that would be horrified at the mere idea of soiling their hands with manual labor. It might be thought that in those circumstances there would exist golden opportunities for foreign engineers to take public works in hand, and there were no doubt many Chinese who would only be too glad to see that take place. That, unfortunately, was where racial prejudice came in, and the anti-foreign feeling of uneducated masses rendered outside assistance extremely difficult of application. Even when influential Chinese did promote public schemes for lighting, etc., and instal the necessary plant, maintenance and depreciation were items grossly neglected, so that the undertaking did not endure for long. However, the present disturbances would pass over, and in a very few years great progress should be made.

Mr. Sarjeant gave in his lecturette, and also in answers to specific questions from members, particulars of the training, experience and duties required for young engineers for different parts of China, and he also described the kind of life that was led and what it cost.

Tokyo-Osaka Fast Line Plan.—Vernacular papers report that the plan for a rapid-transit line connecting Tokyo and Osaka and capable of traversing the distance in six hours has again been brought to the fore. It is being backed this time by about 30 influential businessmen, including Mr. Kaichiro Netsu, private railway magnate, Mr. Shintaro Ohashi and Baron Seinosuke Goh. An application has been submitted to the Tokyo Prefectural Government and is expected to be turned over to the Ministry of Railways. The Ministry, says the Tokyo Nichi Nichi, is strongly against the movement.

The plan as outlined involves the construction of a double-track broad gauge electric railway at a cost of Y.250,000,000 starting from Shibuya, a Tokyo suburb and terminating in Nakanomachi, Kita-ku, Osaka. The proposed line would touch Kanagawa, Shidzuoka, Nagoya and proceed to Kyoto by way of Kameyama in Miye Prefecture along the Sangu line of the Imperial Government Railways.

The present Tokaido Line is 222 miles and it takes 12 hours to reach Osaka from Tokyo. The proposed line is 299 miles long but Osaka can be reached in six hours. A similar plan was submitted to the Ministry a few years ago by the late Mr. Yujiro Tachikawa but was rejected.

This plan is unanimously opposed by officials of the Ministry of Railways, it is reported, because the Tokyo-Osaka line is Japan's main line and is nationalized. The construction of such a rapid transit line would cause a greet decrease of the state railways receipts.

Ling Sang Printing Ink Works, Shanghai.—Owing to the growth of business, the Ling Sang Printing Ink Works, removed its sales office at 33 North Szechuen Road, Shanghai, to Wei Shui Fang, corner of Chekiang and Ningpo Roads, Shanghai, on October 25, 1926, with Yuan Sung Ting as its new business manager. The factory itself is located at 165-7 Tien Tung An Road, Chapei, Shanghai. It was first established in 1917 at Kiangwan Road, Shanghai, with a capital of $50,000. The factory is principally engaged in the manufacture of printing inks, and for this purpose has eight sets of machines of American make. The wood oil used is obtained from Szechuan, the resin from Wenchow and Fukien, the ink powder from Wenchow and Anhwei, and the chemicals from abroad. Its output is about 1,500 lbs. of printing ink per day. Since October, 1926, the factory has also been manufacturing varnish, which is sold at $0.25 to $0.40 per pound. It turns out about 1,000 lbs. of varnish per day. The two products are largely consumed in Shanghai and Kwangtung. The owner of the works is Ou Wei-kuo and the general manager Ch'en Hsing-wu.

Bank Buildings to be Erected in Mukden, China.—Three of the largest banks in Mukden, China, have recently purchased sites between the Chinese city and the railway settlement on which new bank buildings will be erected, according to Vice Consul Angus I. Ward, Mukden. The buildings will cost about $100,000 each.

Chen Hwa Paint Factory, Shanghai.—The Chen Hwa Paint Co., Ltd., with an office at 271-2 North Soochow Creek, has its factory at Tan Tze Wan, Ferry Road, Shanghai, covering a total area of 15 *mow*. The company was founded in 1918 by C. P. Loh, and K. C. Shao with a fixed capital of Tls. 200,000 and a circulating capital of Tls. 300,000; its output last year was valued at over $300,000. The company made a profit of $24,000. More than a hundred workmen are employed in the factory, which is under the supervision of Prof. Z. C. Dage, of the National Institute of Technology, who also serves as chief engineer.

The factory manufactures ceruse or white lead, using the pig-lead produced at Changsha, Hunan province, as raw material. The raw material comes in bars of 140-150 catties each, costing Tls. 23 a piece. It is first made into sponge-lead and is then rendered soluble by soaking in vinegar. It is further treated with chemicals and precipitated in a white pasty form. The factory turns out 20 piculs of this pasty stuff every 24 hours. To make it into ceruse, the pasty stuff is wrapped in cloth and pressed into a solid cake to squeeze out the water content. The solid cake is further dried by baking before it becomes ceruse.

Another white pigment is manufactured from metallic zinc produced at Sungpai, Hunan province. In this case, the raw material is simply heated on hearths until it turns into small particles, which are delivered to another department for grinding. This department occupies two floors. On the lower floor, a grainding machine is installed, to which is attached a fanning machine. When the white particles are ground in the grinding machine, the fanning machine is also set in motion so as to blow the fine powder through an iron tube to the upper floor, while the heavier particles are returned to the grinding machine for further grinding. The fine powder is zinc oxide.

Red lead is also manufactured in the factory through a similar process, using piglead as raw material. The latter is first melted on a hearth at a very high temperature. By raising the temperature and continuing heating, the lead finally turns into brown particles, which are ground in the grinding machines and baked. The resulting fine powder is of a red color and is known as red lead.

"Red iron oxide" a stuff for preventing iron and steel from rusting, is manufactured from green vitriol produced at Poshan, Shantung province. The raw material is simply burned into fine particles to form the above named product.

White powder for white—washing walls is manufactured from white rocks produced in the mountains of Huchow. The rocks are ground with grinding stones together with water.

The oil refining department of the factory is equipped with large boilers to hold 7,000 catties of oil. Linseed oil produced at Kalgan is used. The oil in the boiler is heated to boiling point.

In the boiler, a stirring device is set in motion to bring the dregs up to the surface. This refined oil is used to make white paint by mixing with ceruse, or to make paints of any other colors by adding other coloring matter. The Chen Hwa Paint Co., manufactures paints of all colors and varieties, varnishes, stains, and enamels for sale at prices considerably lower than those of imported goods.

Wireless Station in Nanking.—The wireless station at Pehchikoh, Nanking, capital of Kiangsu province, will soon be completed at a total cost of about $40,000. All equipment installed at the station is Chinese make, except the dynamo, which was ordered from America. The station will accept commercial messages. A radio service will also be attached to the station to communicate with Woosung and Shanghai. The new station will be formally inaugurated on November 28.

Shanghai-Chuansha Light Railway Company—A regular launch service between Tatu'an and Chuansha via Santun Er'htu'an, Liutsaowan, Nanwei, Szutu'ants'ang, Chuchiachiao, and Chitsao was established by the Shanghai-Chuansha Light Railway Company, on November 5, 1926. The launch will accommodate approximately 40 passengers per trip and the fare from Chuansha to Chuchiachiao is ten cents each. The regular light railway fares from Chuansha to Shanghai are 69 cents each first class and 39 cents second class. The construction of the light railway line from Wangchiahsiang to Chuansha, a distance of 10 *li*, was completed on July 10, 1926. The company was originally capitalized at $150,000, but another $150,000 at $20 a share is being raised.

Hu-Hai Railway.—The terminal point of the new Hulan-Hailun Railway was originally Sungpu, 8 *li* from the Sungari river at Harbin. This distance had to be covered by cart. For the convenience of passengers and for transportation of goods, the railway has now built a branch line 7½ kilometers in length to the Sungari, the terminus being Machiankao, opposite Harbin. Passenger and freight traffic is now in operation over a total length of 27½ kilometers. Workmen's trains go still farther, about 60 kilometers. Construction has been carried on under trying conditions, heavy rainfall, early frost, snowfall, hard ground, absence of roads, sand, wood and other needed construction materials. In 1927 it is expected the line will be completed to Suihua, 120 kilometres from Harbin, not counting sidings at various stations.

New Docking Facilities in Shanghai.—New docks for the unloading of coal are being built at Kiangyin, Kiangsu, by the Kailan Sales Agency, 6 Szechuen Road, Shanghai. A hulk is in process of construction to serve as the landing point for coal for transhipment to the factories in Wusih and Changchow by barge. A part of the river front has been raised some 15 feet and completely bunded. The pier and the hulk will together cost approximately $200,000, and a godown for storage purposes approximately $100,000. The new project will make it unnecessary to bring coal into Shanghai for transhipment to Wusih and Changchow by the Shanghai-Nanking Railway.

New Air Lines for Japan.—An order for a fleet of twenty-five large airplanes to cost $1,250,000 has been received by a British firm from Japan. The machines will accommodate from fifteen to twenty passengers each and have a speed of more than 100 miles an hour. They will be used in regular service on the new Japanese routes to be opened next year. Each plane will be driven by two Napier engines developing 1,000 horse-power.

It also became known to-day that large orders for military aircraft had been placed by Japan with other firms, but details have been kept secret.

Central Asia Railway.—Work will begin early next year on two great engineering projects—the Frunze-Semi Paliatinsk Railroad and Dnieper dam and power plant and the Volga-Don Canal.

The railroad is the most important in political and economic value. The Frunze line, formerly called the Pishek, is linked as a branch road to Tashkent, which will be the administrative centre of the new line in North Central Turkestan. Semi-Paliatinsk is the present terminus of the branch from the junction of the Trans-Siberian at Novonicolaevsk.

The road will be 1,500 kilometers long, will cost 150,000,000 rubles and is to be completed in four or five years. It will border the frontier of the Chiness outer Mongolia region, the ancient Chinese caravan junction city of Kuldja, whose trade it is expected to tap, and along the pass cut by the River Almata through the Heavenly Mountains, which from the frontier.

This railroad will convey Siberian grain, lumber, etc., to Central Asia, which thus will be progressively devoted to the cultivation of cotton.

It will further open the partly unexplored region of the Altai range, which here is believed to be one of the world's richest in minerals.

The Dneiper River project contemplates the final production of 650,000 horse-power, but the initial program is limited to the installation of three turbines of 50,000 horse-power each. Chief Engineer Gunter declared to-day that turbines of this size are not made outside of America, but he did not say definitely whether they would be ordered there.

The Dnieper project will cost from 10,000,000 to 20,000,000 rubles.

The canal linking the Volga in the neighborhood of Ulyanovsk (formerly Simbirsk) with the Don, northeast of Rostoff, ninety-seven kilometers long, will permit the cheaper export of lumber from the vast forests bordering Kama on the Upper Volga.

It was contemplated long before the war, when a French engineer reported favorably on its possibilities, but it has been studied in detail only since 1922. A special board appointed by the Soviet Central Executive Committee is expected soon to make a final choice between the two alternative schemes and plans are made to begin work after the Spring thaw.

Japan and the Continental Steel Trust.—Dr. Noda (chief engineer of the Japanese Government Steelworks), accompanied by Mr. Shibusawa, President of the Fuji Steel Manufacturing Company), Mr. Imaizumi (managing-director of the Japan Steel Tubing Company), and Dr. Okochi (Member of the Japanese House of Lords), representing the Japanese Parliament, who all belong to the recently-established Japanese Steel Advisory Commission, are visiting Germany in order to study the situation created by the new Continental Steel Trust. In view of the demand of the Japanese steel industry for increased duties on steel, the Japanese Government has directed the visitors to collect material which will enable them to consider the proposal in all its bearings.

List of vessels Constructed by Wm. Simons & Co., Ltd., Renfrew. During the year 1926

Vessels Constructed	Tonnage Gross	I.H.P.	Owner
Suction Dredger	864	4,500	Colonial
Hopper Barge	907	1,400	British
Hopper Barge	907	1,400	British
Barge	340	—	Colonial
Barge	340	—	Colonial
Barge	340	—	Colonial
Suction Hopper Dredger ...	2,272	3,500	Colonial
Dredger	570	1,000	Colonial

State of Trade at the Imperial Steel Works during November.—During November, trade at the Imperial Steel Works showed a tendency to improve, largely owing to the improvement in fuel supplies and in national trade generally.

The Tool Steel Department experienced a continued demand for Hollow Drill Steel and Stainless Steel.

The Forging Press received orders for mining shoes for stamp batteries, and is finding business better.

The Small Tolls Department also found trade brisk during the month, and received an interesting order for High Speed Steel Twist Drills for the Far East.

The Saw Department has been handicapped by the difficulty of getting plates rolled for the larger sizes of circular saws, but has been using up existing stocks of plates and is at the moment working on orders for hot saws, friction discs, cold saws, and diamond saw blades.

The Tramway Trackwork Department received a fair number of orders for Imperial Manganese Steel points and crossings.

The Steel Foundry, Railway Trackwork Department, Engineering Department, and File Department, all report signs of improvement upon the October business, which was fairly good. It is hoped that during the New Year business will be brisk in all these department.

An interesting visitor to the Imperial Steel Works in the first week in December was the Prime Minister of New Zealand, Mr. J. Coates, M.C.

Annex for Medical University at South Manchuria.—Work was commenced the latter part of September on an annex to a medical university at South Manchuria, and will continue for three years, according to Vice Consul Angus I. Ward, Mukden. The principal features of this annex will be consultation and treating rooms for "out-patients," and an up-to-date research laboratory. The building will cost 1,390,000 yen (about $861,100).

Toshin Electric Ready to Absorb Chikumagawa.—The Toshin Electric Company, affiliated with the Tokyo Electric Light Company, has decided to absorb the Chikunagawa Electric Power Company, capitalized at Y.7,500,000 a quarter of which is paid up. The term of merger is in the ratio of 10 shares of the Chikumagawa to 9 shares of the Toshin interests. The matter is to be submitted to a general meeting of shareholders of each firm.

The Mie Godo Electric Company in Tsu City, Mie prefecture, which recently merged the Tokushima Hydro-Electric Power Company and increased its capitalization to Y. 27,630,000, has decided to absorb three minor electric power firms in Tokushima Prefecture. These firms are the Nishina, Naka and Miyakochi hydro-electric power companies, each capitalized at Y.300,000.

Internal Combustion Shunting Locomotives for Siam.—The Royal State Railways of Siam have placed an order with the Swiss Locomotive and Machine Works, Winterthur, for two internal-combustion locomotives at a price of $4,200 each, c.i.f., Bangkok. This order was placed in conformity with tenders called for February 11, 1926, and opened June 28, 1926. An American manufacturer tendered through a local American firm, at a low price with quick delivery for locomotives already in stock, but these tenders were for steam locomotives, for which type of engine, although included in the tenders of the Royal State Railways, no orders have been placed.

American Cars Bring New Transportation Era.—Sales in automative lines have been well maintained during the July to September period, especially when it is considered that the summer months usually represent the slack season for automobile sales in Japan. Sales ot light American cars and trucks are doing much to popularize motor transportation in Japan and the antiquated methods of transportation are being rapidly replaced with small cars and one-ton trucks. The marked competition among the better makes of cars is becoming keener on account of the limited opportunities for the sale of the higher priced makes.

Motorcycle sales have materially slowed up during the summer but considerable activity is expected during the fall season. While heavy machines are increasing in demand, the light weight American and British motorcycles enjoy the greatest sale in this market. There is also considerable demand for side cars and accessories.

The general outlook for sales during the fourth quarter is considered good.

Daido Signs Pact with Osaka.—The Daido Electric Power Company concluded an agreement with the Osaka Municipal Electric Bureau under which the contracting parties make certain changes from their original pact of April 1, 1923. The changes include a five-point reduction in the load factor and a drop of .02 sen in the charge per kilowatt hour. The fact that the company may market the power released by the reduction of the load factor, however, makes its present position in Osaka, almost as advantageous as formerly. The revised contract was made effective from October 1.

In 1923, the company made an agreement to supply Osaka with power up to 100,000 kilowatts. On April 1, 1923, it was supplying 20,000 k.w. A year later this amount was increased to 24,000 k.w., of unseasonable power. The next year boosted the total to 32,000 k.w., and 1926 saw an increase to 40,000 k.w. This power was all supplied at a rate of 2.3 sen per k.w.h., at a load factor 2.3 sen per k.w.h., at a load factor of 70, the accounts payable monthly. The contract, however, stated that the agreement was subject to amendment on October 1, 1926. On that date the negotiations had not been concluded.

The November 5 agreement covered 40,000 k.w., with a load factor of 65 and a rate of 2.28 sen. The original agreement had contained an agreement that the company was to supply 5,000 k.w., more of unseasonable power and 5,000 k.w., of seasonable power on April 1, 1927. This provision was altered. The company now agrees to supply 6,000 k.w., of unseasonable power to the city on April 1. It has already made provisions to generate this power and, in view of the change in the arrangements, has been enabled to sell the 4,000 k.w., thus released to various electric trolley car companies in and around Osaka.

Only the original 20,000 k.w., supply should have come up for revision on October 1, but that the company had agreed to include everything in the new agreement, which will run out the original 10 year period.

The original annual charge for 40,000 k.w., at LF 70 and rate 2.3 sen was Y.641,440. The charge for the same amount of power under the new contract is calculated on 129.8 instead of 141 and amounts to Y. 5,192,928. The power released by the change in the load factor and the 4,000 k.w., additional which the company may sell from the amount it expected to supply the city next spring, however, out the annual reduction to about Y. 200,000.

The contract with the Ujigawa Electric Power Company for 4,000 k.w., with a load factor of 65 and a rate of 2.2 sen, instead of LF 70 and rate 2.3 was signed the following day. On Monday the Nippon Electric Power Company concluded a contract to run until March 31, 1932, at the same terms for 3,000 k.w. This was a new contract.

Lead Mines Discovered in Shantung and Fengtien—A rich lead ore deposit has recently been discovered west of Tachushan, Kiaochow, Shantung province, by a merchant named Wang Yenkwei, who has raised $50,000 and is applying for official sanction to operate the mine.

At Tsian, Fengtien province, another lead mine has been discovered. The Chief of the Provincial Industrial Bureau has appointed experts to explore the mine with a view to further development.

Chemical Trade in China.—A D.O.T. Report, just published, says: in spite of the disturbed conditions which have prevailed throughout the entire period under review, this trade shows steady expansion which must be attributed to industrial development. In the Customs returns for 1925 sulphate of ammonia heads the list of heavy chemicals imported during the year, the others, in order of value, being: Soda ash, caustic soda, sulphide of soda, glycerine, chloride of lime (bleaching powder), calcium carbide, nitrate of soda, saltpetre, and silicate of soda. The principal uses for these are :—Soda ash : Foodstuffs, paper making, glass making, dyestuffs, metallurgy, and household. Caustic soda : Soapmaking, mercerising. Sulphide of soda : Dyeing, dyestuffs. Glycerine : Cigarettes, medicines, cosmetics. Chloride of lime : Bleaching cotton and pulp, disinfectants. Calcium carbide : Lighting. Nitrate of soda : Fertilisers. Saltpetre : Fireworks, munitions. Silicate of soda : Soapmaking, adhesives, barrel lining. The chief feature of the heavy chemical trade during the year ended June, 1926, was the remarkable progress made in the chemical fertiliser business, particularly in the provinces of Chekiang and Kiangsu. It is evident that artificial fertilisers, owing to their greater efficiency and the ease with which they are handled, will eventually to a large extent replace the old-fashioned Chinese fertilising methods. Chemical fertilisers were practically unknown in China, North of Fukien, until the summer of 1924. The fertiliser which is at present imported in the greatest quantity is sulphate of ammonia, which is particularly suitable for fertilising rice. Other fertilisers imported in smaller quantities are nitrate of soda, nitrate of lime, superphosphate, etc. Some progress has also been made with mixed fertilisers, specially prepared to meet the requirements of particular crops, such as cotton, sugar cane, tea, etc. These, however, have only recently appeared on the market, and it is too early to judge of their success.

Trans-Pacific Coaling Station.—For the first time in the history of trans-Pacific shipping vessels of American lines will be enabled to make a stop-over along the "great circle" route to Japan and China through the establishment of a fueling station in Kiska Island, at the end of the long Aleutian chain sticking out of Alaska's mainland like a pipe.

One of the advantages of a fueling station about halfway across the ocean is the conservation of space for cargo. During recent months American vessels have carried capacity loads and many cargo offerings have been refused on account of the necessity of reserving ample storage for the enormous quantity of fuel required for eleven to fourteen days of constant steaming.

When the fueling facilities on Kiska Island are provided the big ships can carry only enough coal and oil to reach the reserve supply there. The United States Navy has held a claim on Kiska Island for many years, in view of fueling and naval advantages in case of war. In the case of its being used for peaceful purposes, an excellent quality of coal and, possibly, of crude oil may be found near Anchorage, Alaska. It also is known that coal exists on the island itself, as well as on others of the Aleutian chain.

Out at the end of the Aleutian Islands lies Attu, the furthest west of the North American continent, on which when the summer's sun has set it is rising on the coast of Maine. Near by is Kiska Island, the potential naval base and mid-Pacific fueling station. As a further aid to vavigation it is planned to establish on Kiska a gigantic radio station so located as to be in communication with shipping on all parts of the north Pacific.

Steel Orders from Far East :—U. S. Steel Products Co., subsidiary of U. S. Steel Corp., has booked order for 134,000 feet of black gas pipe from Imperial Government Railways of Japan.

Orders for moderate round tonnages of tin plate have been placed with American makers by Chinese consumers, and a tin plate inquiry from China is still in this market.

Japanese Electric Co. Formed in N. Y.—Formation of the Japanese Electric Bond and Share Company, representing a co-operative undertaking by Japanese, American and English interests was announced on December 28 by the Guaranty Company of New York. The action is an outgrowth of extensive financing for Japanese power companies in New York and London.

It is intended that the new company shall operate in Japan along the lines of the Electric Bond and Share Company in the United States, with such modification as local conditions may make necessary. The initial capital of the company will be Y10,-000,000, 25 per cent. of which will be paid at this time.

Japanese companies financially interested are the Japanese Marine and Fire Insurance Company, which is closely related with the Mitsubishi interests; the Yasuda Holding Company, Inc., the Mitsui interests, the Tokyo Electric Light Company, Ltd., and the Toho Electric Power Company, Ltd.

American and English interests are the Guaranty Company of New York, the International General Electric Company, the Electric Bond and Share Company, Lazard Brothers & Co., Ltd., London : Lazard Freres, New York; Sale & Co., London, and Sale & Co., Tokyo.

New China Mail S.S. Company :—A few years ago the old China Mail Steamship Company owned and operated by Chinese, was forced out of business by the weight of the many heavy fines imposed on it by the American Government for booze and opium smuggling. Efforts are being made in China to reorganize the company and resume its old schedule of sailings. New liners are to be purchased or chartered to operate with a sailing every two weeks to San Francisco.

Japan Buys Tin Plate :—Orders for 71,500 boxes of tin plate for Japan have been distributed by Japanese houses here with American makers. Of total, 57,500 boxes were for Nippon Oil Co. and 14,000 boxes for Kioto Oil Co.

General Motors in Japan :—Engineers and sales executives of General Motors are in Japan looking over location at Kobe for construction of an assembly plant to supply the Japanese market and eventually the Chinese market.

M/S "P. C. Hooft" :—The maiden voyage of the *P. C. Hooft* (fitted out with Sulzer Diesel engines) from Amsterdam to Batavia and back, a distance of about 18,000 miles, proved satisfactory in every respect. The time table was punctually and easily kept to, and if the ship had not been due to arrive at certain ports at certain dates, the time required for the voyage could have been shortened considerably. The engines were never worked at top speed; often, for example on the outward voyage from Southampton to Algiers, they only ran at 50 to 70 revolutions instead of the normal 100, on account of fog; in spite of that, the *P. C. Hooft* arrived at Batavia three days sooner than originally intended. On the home voyage the engines again ran at only 90 revolutions between Genoa and Amsterdam, in order to avoid arriving too early.

During the whole voyage the engines worked continuously and faultlessly. The figures for fuel and lubricating oil consumption are rather less than guaranteed, so that also from the point of view of economy expectations were completely fulfilled.

The passengers often commented on the smooth running of the engines, as well as on the total absence of smoke and sparks. At the end of the voyage the deck was as clean as at the beginning.

M/S Aorangi :—The liner *Aorangi*, equipped with Sulzer engines, has now been exactly 2 years in regular continuous service and has in this time run over 200,000 miles without having had to be laid up once for overhaul. It is particularly worth noting that on the last voyage from Sydney to Vancouver all existing records for the run between Australia and North America were again broken. We extract the following from a Vancouver newspaper of December 10 :—

"*Aorangi* makes voyage record. When the M.S. *Aorangi* docked in Vancouver yesterday afternoon she broke all records of runs from Australia and New Zealand to Vancouver until Friday evening and she is more than 24 hours ahead of schedule."

"*M/S Aorangi arrives ahead of voyage schedule.* Once again the ocean greyhound R.H.M.S. *Aorangi* has beaten her own schedule by a day, and arrived in the Port of the Lions' Gate approximately 24 hours ahead of time under the command of Captain R. Crawford, R.N.R."

Chung Hua Flour Mill, Shanghai.—The Chung Hua Flour Mill has been re-organised and is now known as the Chung Hua Fung Chi Flour Mill. The new capital of the company is Tls. 40,000, divided into 40 shares. Its sales office on the first floor of the Hwa Dah Commercial & Savings Bank Building. 52 Rue Montauban, French Concession, Shanghai, was formally opened on November 19, 1926. It has its mill near the ferry of Tan Tzu Wan, Chapei, Shanghai. Its daily output is 3,000 bags and is sold under the trade-mark of "Three Stars" and "Airship." Ting Hou-ch'ing is the manager and Chou Shih-yu the assistant manager.

Chinese Tramway Company in Shanghai.—On account of the depreciation of copper exchange, and the general increase in wages paid to conductors, motormen and workers, the Chinese Tramway Company, Nantao, Shanghai, has increased its fares. The minimum fares of 6 coppers for first class and of 3 coppers for second class remain unchanged. The minimum increase is 1 copper and the maximum 2 coppers. The rate of exchange is 270 coppers to the dollar.

Abolition of Telegraph Offices in Manchuria—The revenue of the telegraph offices along the Chinese Eastern Railway has shown a sharp falling-off during recent years owing to the growing competition of the long-distance telephone services. In order to save expenses the Superintendent of Telegraph in the Three Eastern Provinces of Manchuria has abolished the telegraph offices in the following eight places: Mulingchan, Tiehlingho, Hengtaohotze, Makiaoho, Hinganling, Chalainor, Mientuho,and Fularki.

10" Borehole Pump for Chapei Electricity and Waterworks Co., Shanghai.—Sulzer Brothers has just received, through Messrs. Sintoon Overseas Trading Co., Ltd., Shanghai, an order for a 10" Borehole Pump for the Chapei Electricity and Waterworks Co., Shanghai, direct coupled to a vertical Brown and Boveri motor and for an output of about, 1,000 U.S. Gallons per minute and a geodetic head of 100-ft. below and 120-ft. above ground, the power wanted at the coupling being 99 B.H.P.

New Exchange Building, Tsingtao,—A new three-story exchange building, built of brick, reinforced concrete and granite, at a cost of $300,000, has been opened in Tsingtao. It has four large halls extending through two stories, intended for exchange purposes, and 119 rooms for offices. American lumber and structural steel were used in its construction, and the designs of an American engineering firm were followed. The building is considered the finest commercial structure in Tsingtao.

New Shipping Company in Foochow—A group of Fukien and Kwangtung capitalists have organised the Kwang Fu Steam Navigation Company with a capital of $500,000. Three steamers, the *Heng An*, *Teh Li* and *Tu Fu* have been chartered. The *Teh Li* is to sail between Foochow and Hongkong with Amoy and Swatow as ports of call and the other two between Foochow and Canton calling at Amoy and Swatow. The direct sailings between Foochow and Canton will do away with the stop at Hongkong. The company is financed exclusively with Chinese capital.

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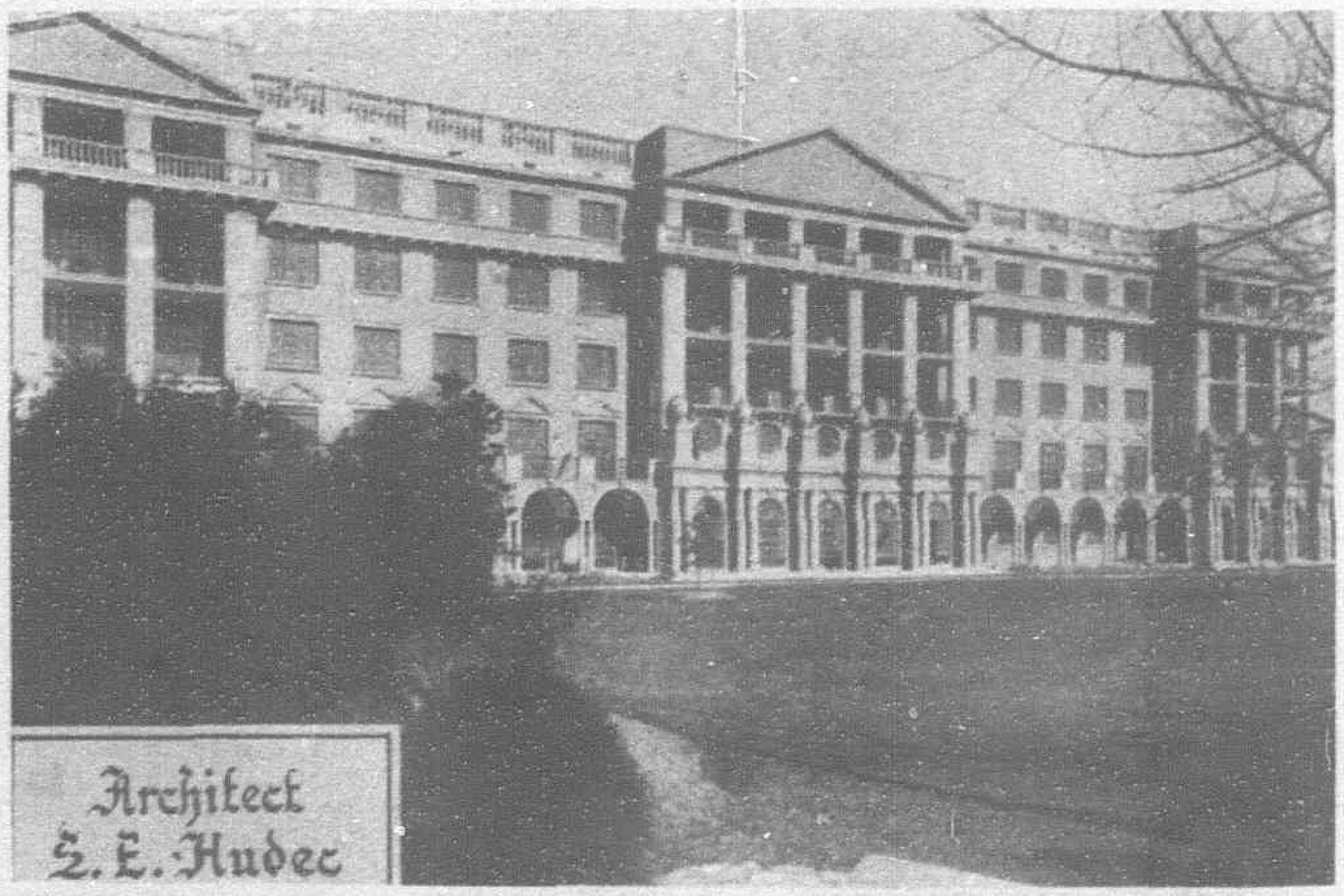

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